RAILROAD GAZETTE

FRIDAY, FEBRUARY 24.

Contributions.

Alleged Cause of the Spuyten Duyvil Accident.

SAVANNAH, Ga., Feb. 13, 1882.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read with interest the articles which appeared in the *Railroad Gazette* and in other papers in relation to this occurrence. In some of these articles it has been inferred that the accident was caused from the Westinghouse automatic brakes being put on by some passenger in the cars. No reference, so far as I am aware, has been made to the fact that when the brake is applied from a car in the train they are only effective so long as the person applying the brake holds the valve cord in his hand.

If, then, the application of the brake were momentary, the effect should only have been momentary, and I have not as yet seen it stated that the brake was applied in this way continuously until the train stopped.

It would be of value to your numerous readers if you could inform them whether the evidence at the inquest establishes the fact that the brake was put on from a car in the train; for, if this were the case, then it follows that the person applying the brakes in this manner must have held the valve cord in his hand until the train stopped, and if he could be detected, he is really morally responsible for all the consequences which followed his injudicious act, and if this was not the case then it still remains to be explained who did put the brake on.

H. S. HAINES,
General Manager, Savannah, Florida & Western Railway.

[The facts which our correspondent inquires about were not, so far as we know, brought out by the coroner's inquest or any other investigation. It is currently reported, however, that the safety-cord of the brakes was pulled by one of a number of half (or quite) drunken occupants of a compartment of one of the drawing-room cars which was burned up. It is said that he held on to the cord for some time. If he did this, it would permit the compressed air in the main reservoir in the engine to escape, and thus make it impossible for the locomotive runner to release the brakes until he had first "pumped up the pressure" in the main reservoir.

When the train was stopped, though, the locomotive runner could of course not know the reason for it, and naturally would go back or send back to find out what was wrong. On learning that nothing was the matter, excepting that some persons were drunk, he set to work to release the brakes, which, under the circumstances, he could only do by "bleeding" the auxiliary reservoirs; as, according to rumor, he had not sufficient air pressure in the main reservoir to release the brakes in the ordinary way.

We agree with our correspondent that the person "who held the valve cord is morally responsible for all the consequences of his injudicious act."—EDITOR RAILROAD GAZETTE.]

Equalizing Grades and Curves.

RENO, Nev., Feb. 3, 1882.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In answer to the inquiry of C. D. Ward in the *Gazette* of Jan. 27, I would say that we make our changes of grade at the beginning and end of the curves. Mr. Wellington says that "for evident reasons," the reduction of grade should begin a little way along on the curve, and should extend half a train length beyond the end of the curve.

I must confess that I am unable to see what those evident reasons are. The only object in reducing the grade on the curve is to reduce the resistance due to gravity just enough to compensate the resistance due to the curve. The instant the first wheels run on to the curve the train begins to feel the curve resistance, and the instant the first wheels get on to the tangent beyond the curve, it begins to feel relief from this resistance. If the reduction is exactly right, the sum of the curve resistance and the resistance due to gravity on the curve will be equal to the resistance due to gravity alone on a tangent. Taking these two facts together, it seems clear to me that the resistance to the movement of the train is equal at all parts of the train, when the reduction is properly made, and, if it is, the proper place to begin the reduction is at the beginning of the curve; and to end it, is at the end of the curve. If these points are made beyond the points of curve and tangent, that part of the train between the point of curve and the reduction point has just as much resistance due to gravity to overcome as the part on the tangent, and, in addition to it, the curve resistance. When running on to the tangent at the upper end of the curve, these conditions would be reversed. The consequence would be an uneven movement of the train. If this view of the case is wrong, I will be very thankful for proof of it, for I am extremely anxious to get at the *facts* of this important problem. I will add that when running on to or off the curves laid out by my table there is *no* unevenness of motion at the beginning or end of curves.

In my former article I forgot to state that the train consisted of an engine and five cars, making a total length of about 180 ft. Longer trains would probably require a little more reduction, but how much can only be determined by experiment. I think the table of reductions will do *to begin experiments* on for a standard-gauge road, if curves are not sharper than 10 or 12°, but would not like to give a decided opinion until I have time to hunt up the results of the argument between yourself and the Engineer of the Bell's Gap Railroad in regard to the comparative resistances of curves on different gauges.

H. G. MCCLELLAN,
Chief Eng. Nevada & Oregon Railroad.

Wheel Service.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I give below a table showing comparative cost of steel-tire and cast-iron wheels in passenger service.

One hundred and sixty-eight steel-tire wheels were worn out or condemned from other causes for the year ending Dec. 31, 1881. Their actual average mileage has been 198,446 miles, and the actual average time in service has been 2,268 days (or 6 years 2 months 18 days).

One hundred and twenty-seven cast-iron wheels were worn out or condemned from other causes for the year ending Dec. 31, 1881. Their actual average mileage has been 34,290 miles. To make 198,446 miles—the life of a steel-tire wheel—it will require 5.7874 cast-iron wheels, and the time in service to make 34,290 miles would be 392 days.

	Wheels. 1 pair steel.	Wheels. 5.787 + pairs cast-iron.
Value	$100.00	$162.05
Cost of fitting, etc	4.50	11.57
Interest	44.94	28.94
Total	$149.44	$202.56
Value of old wheels	18.75	77.49
Total cost to run 198,446 miles	$130.69	$125.07

The method by which the figures in table are reached is as follows, viz.:

Iron Wheels.

1 pair wheels	$28.00	
Fittings, etc	2.00	
		$30.00
Interest, at 6 per cent., for 392 days, life of wheels		1.93
		$31.93
Less old wheels		13.39
		$18.54
2d pair wheels and fittings, etc		30.00
		$48.54
Interest, at 6 per cent., for 392 days, life of wheels		3.13
		$51.67
Less old wheels		13.39
		$38.28
3d pair wheels and fitting, etc		30.00
		$68.28
Interest, at 6 per cent., for 392 days, life of wheels		4.40
		$72.68
Less old wheels		13.39
		$59.29
4th pair wheels, fittings, etc		30.00
		$89.29
Interest, at 6 per cent., 392 days, life of wheels		5.75
		$95 04
Less old wheels		13.39
		$81.65
5th pair wheels, fittings, etc		30.00
		$111.65
Interest, at 6 per cent., for 392 days, life of wheels		7.20
		$118 85
Less old wheels		13.39
0.787 + pair wheels	$22.04	
Fittings, etc	1.57	23.61
		$129.07
Interest, at 6 per cent., for 308 days, life of 0.787 +		6.53
		$135.60
Less 0.787 + old wheels		10.53
Total cost to run 198,446 miles		$125.07

Steel Wheels.

1 pair steel-tire wheels	100.00	
Fitting, etc	2.00	
		$102.00
Interest, 6 per cent., for 392 days		6.57
		$108.57
Interest, at 6 per cent., for 392 days		7.00
		$115.57
Interest, at 6 per cent., for 382 days		7.45
		$123.01
Turning wheels, etc		2.50
		$125.52
Interest, at 6 per cent., for 392 days		8.09
		$133.61
Interest, at 6 per cent., 392 days		8.61
		$142.22
Interest, at 6 per cent., for 308 days		7.22
		$149.44
Less old wheels		18.75
		$130.69

This is the result of careful daily records of actual mileage made, and all wheels are included from whatever cause removed. The conditions and circumstances connected with other roads (curves, condition of tracks, grades, etc.), would undoubtedly differ in many respects and might, therefore, materially change the result. The greater the daily mileage the greater is the advantage to the steel-tire wheel, in the matter of interest on investment. It is, therefore, clear, leaving all other considerations out of the question (wear of track, jolting of cars by the pounding of cast-iron wheels not round, etc.), that on shorter roads, making small mileage, the interest would carry the figures above those shown here. There are other questions, however, beside immediate cost which enter into this matter to influence railroad managers.

I believe the problem before us should not be wholly that of dollars and cents, but that safety and comfort should enter very largely into our consideration, and that any railroad doing a large passenger business cannot afford to run cars having any other than wheels turned round, and holes bored exactly in the centre for wheel fit.

Careful tests should always be made before putting wheels out for use to insure the best results.

It is fair to state that no accident has occurred by the use of these steel-tire wheels, and that their mileage will certainly increase from year to year.

In connection with the above subject, I will put a few questions which it might be well for those interested to consider.

1. In view of the foregoing statement, is there any doubt as to the safety of steel-tire wheels?
2. Is there any doubt as to their economy?
3. Is there any doubt as to their ability to carry a car more smoothly and easily?
4. Providing the circumstances should carry the cost of steel-tire wheels (turned perfectly round) considerably above that of a cast-iron wheel, would it be economy for a railroad to use cast-iron wheels under passenger cars?
5. At what point in variation in cost of these two kinds of wheels (providing steel-tire wheels to cost the most and to give the greatest comfort and ease) ought economy to be considered?
6. Is it possible to make a cast-iron wheel round?
7. Presuming cast-iron wheels to be irregular in their diameter at different points, do they usually cause the uneasy motion after experiment while riding in passenger cars?
8. Is the uneasy motion as noticeable in cars carried by turned steel-tire wheels?
9. Ought wheels condemned because of flat spots by sliding to be replaced, without charge, by the roads so unfortunate as to be found with flatted wheels on their lines.
10. Is it possible to locate the exact point where these flats are made by any methods of inspection now in existence?
11. Ought wheels condemned from whatever cause or circumstances to be styled worn-out wheels.

NEW ENGLAND.

The Inadequate Supply of Locomotives.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The writer of the article that appeared in your issue of the 13th January last, under this head, doubtless stated his conscientious convictions as to the capabilities of European locomotive builders in general and English in particular. His views, however, are very much calculated to mislead, for his reasoning presupposes:

First, that English locomotive builders are so badly off for work that they would be glad to build a *patchwork* engine, such as that he describes.

Secondly, that they are so ignorant of American practice as to need nursing with minutely prepared drawings and description.

Thirdly, that it is not possible to obtain steel plates suitable for fire-boxes in this country, and

Lastly, that there is no one in England possessing the necessary experience in the construction and working of engines of the American type worthy of being entrusted with the direction or supervision of such work.

Now, with regard to the first deduction, it is doubtless a fact that there are locomotive makers in this country needing orders, but it is also an undoubted fact that there is not one of those builders to whom American, or indeed any other, railway companies would intrust their orders who would look at, much less entertain, an offer of work of the character described.

And as for the second inference, I vouch for it as a fact that without a drawing, or sketch, or scrap of description in any shape or form, from the United States, locomotive builders in this and other countries of Europe are building engines of the American type and for use in America under my direction and supervision.

With respect to the third case, astounding as the circumstance may seem in the presence of the writer's declarations, it is nevertheless a fact that steel plates for fire-boxes are being made in this country for use in the United States.

And finally I need only say that large numbers of locomotive engines of the American type of all classes and of the gauges prevailing in the United States intrusted to me by my American clients, and the increasing demand that I experience, is a sufficient answer to the fourth deduction.

And I will only say in conclusion that whatever views the writer may entertain as to the considerations that influence English firms in entertaining orders for American engines, it is only fair to those builders who are constructing for me to say that considerations of this character do not weigh with them.

J. C. C.

[The kind of locomotives described in the article referred to by our correspondent was the American type—that is, with four coupled driving wheels, a four-wheeled truck or bogie, outside horizontal cylinders, with the valve-seats on top of them; and Mogul engines, also with outside cylinders, both kinds to have plate frames and other English details. Such engines may be found on the Great Eastern and other railways in England, and, with the exception of the cylinders being inclined, were built last summer by Messrs. Dubs & Co., of Glasgow, for the Indian State

Railways, and by Messrs. Boyer, Peacock & Co., of Manchester, for other lines. These our correspondent calls "patchwork engines," which is more severe on English practice than the occasion seems to demand. and his case is therefore submitted to the care of the editor of *The Engineer* for discipline. Just what the condition of the locomotive business is in Great Britain at the present time, we have no means of knowing; but we do know, from personal intercourse with some of the leading firms last summer, that they then preferred to build such locomotives as have been described rather than make them with American details, even though they were built under the "direction and supervision" of an engineer as able as our correspondent. There is no reason to doubt that locomotive builders of Great Britain, and other countries of Europe, could, "without a drawing, or sketch, or scrap of description in any shape or form," either with or without "the direction and supervision" of our correspondent, build engines of the American type. What we do say, however, is that if they follow American practice closely they must be guided either by drawings or by directions from some one familiar with the way such work is done here, or by both. To say that a person who has not had any practical experience here could, without minutely prepared drawings, evolve, out of his inner consciousness, a locomotive made precisely as they are made here is sheer nonsense. Our correspondent and other persons in England may be thoroughly familiar with our ways of doing work, for aught we know, but unless he or they have gained their knowledge by actual experience here it will be difficult to make our railroad managers believe it. No disparagment, either, is meant to the skill of "J. C. C.," or other English engineers, in designing locomotives. Some of them might evolve a much better engine than we make "without a drawing, or sketch, or scrap of description in any shape or form," but it would be a different engine from those which are most approved in this country.

With reference to the manufacture of steel plates for fire-boxes, our correspondent submits no evidence that the material made in his country will stand the service for which it is intended as well as that made here does. It would be the most utter folly to say that steel which will stand as well as American steel does cannot be made in England. All that has been said is that thus far English steel has not stood the service and that its use for locomotive fire-boxes has been abandoned by all the locomotive superintendents in that country of whose practice, in this particular, we have any knowledge.—EDITOR RAILROAD GAZETTE.]

Train Accidents in January.

The following accidents are included in our record for the month of January:

REAR COLLISIONS.

On the 2d a freight train on the Cincinnati, Indianapolis, St. Louis & Chicago road ran into the rear of a passenger train near Shelbyville, Ind., damaging several cars.

On the morning of the 5th a freight train on the Burlington & Missouri River road ran into a preceding freight in Seward, Neb., wrecking several cars and killing a brakeman.

On the morning of the 5th a freight train on the Pennsylvania Railroad ran into a preceding freight in Lancaster, Pa., wrecking several cars.

On the morning of the 5th a yard engine on the Concord road ran backwards into some cars in the yard at Manchester, N. H., breaking the tender badly.

On the evening of the 5th a freight train on the Lake Shore & Michigan Southern road broke in two near South Bend, Ind., and the rear section ran into the forward one, wrecking several cars.

On the night of the 5th a passenger train on the Louisville & Nashville road ran into some cars which had broken loose from a preceding freight near Overton, Tenn. The engine and two cars were wrecked and the wreck burned up. The engineer and fireman were killed.

On the night of the 6th a freight train on the Lehigh Valley road ran into the rear of a coal train near Pittston, Pa., wrecking several cars.

On the night of the 6th a passenger train on the Illinois Central road ran into a freight which had gone into a siding at Peotone, Ill., but left several cars projecting out on the main track. Several cars were damaged and the engineer slightly hurt.

On the evening of the 7th a freight train on the Chicago & Alton road ran into the rear of a preceding freight near Milton, Ill., wrecking several cars. The fireman was hurt.

On the evening of the 7th a freight train on the Pennsylvania Railroad ran into a yard engine in the yard in Pittsburgh, Pa. The engine was upset and a number of cars damaged. The conductor was hurt.

Very early on the morning of the 8th a yard engine on the Pennsylvania Railroad ran into the rear of a freight train in the yard at Pittsburgh, Pa., wrecking a car.

On the morning of the 8th a freight train on the Pennsylvania Railroad ran over a misplaced switch in the yard in Pittsburgh, Pa., and into another freight on a siding, doing some damage.

On the afternoon of the 11th a freight train on the New York, Lake Erie & Western road ran into a preceding freight near Port Jervis, N. Y., wrecking the caboose.

On the morning of the 12th a freight train on the New York, Lake Erie & Western road ran into a preceding freight near Narrowsburg, Pa., wrecking several cars.

On the morning of the 12th the engine of a freight train on the Mobile & Ohio road ran into a yard engine at a water tank in the yard at East Cairo, Ky., damaging the tender.

On the morning of the 13th a freight train on the Richmond & Allegheny road ran into the rear of a construction train near Lorraine, Va., wrecking a car and killing two laborers.

On the morning of the 13th a freight train on the Chicago & Alton road ran into the rear of another freight near Beaver Dam, Mo., wrecking two cars.

On the evening of the 13th a local passenger train on the New York Central & Hudson River road ran into the rear of an express train which had stopped near Spuyten Duyvil, N. Y., on account of some trouble with the brakes. The collision drove the rear car, a sleeping car, into the next car, wrecking them both. The wreck caught fire immediately and was entirely destroyed, eight persons who were either killed or injured, and were caught in the wreck, being burned up with it in spite of all efforts to save them. Two persons were saved who were very badly hurt, and some 13 others were slightly injured. Hon. Webster Wagner, of the Wagner Sleeping Car Company, was one of those killed. The coroner's jury censured the company for not having so dangerous a spot supplied with proper signals, and the conductor and rear brakemen have been indicted for manslaughter, because they failed to signal the following train. The setting of the brakes was probably caused by some passenger pulling the cord and setting that automatic brake.

On the morning of the 14th a freight train on the Chicago, Milwaukee & St. Paul road ran into another freight which had stopped on the bridge over the Mississippi at La Crosse, Wis. One span of the bridge gave way under the shock and went down into the river, with several cars. One of the trains had gone on the bridge without orders.

On the night of the 14th a passenger train on the Pennsylvania Railroad was backed into a freight in the yard in West Philadelphia, Pa. Several cars were damaged, and three trainmen hurt.

On the 15th a freight train on the Chicago & Grand Trunk road ran into the rear of a construction train near Edwardsburg, Mich., wrecking several cars and piling up the wreck in a cut, so that the road was blocked for nine hours.

On the morning of the 16th a passenger train on the St. Louis, Iron Mountain & Southern road ran into the rear of a freight near Jefferson Barracks, Mo., wrecking several cars.

On the evening of the 16th a freight train on the Pennsylvania Railroad ran into a preceding freight near Rodebaugh, Pa., wrecking several cars and injuring a brakeman.

On the night of the 16th a yard engine on the Texas & Pacific road ran into the rear of a freight train in Ft. Worth, Tex., doing some damage and killing a brakeman. The engineer and fireman on the yard engine jumped, after reversing the engine, and the engine started off backwards and ran six miles before stopping.

On the afternoon of the 17th a coal train on the Lehigh Valley road ran into the rear of a freight train which had stopped at Cherry Ford, Pa. The engine and 30 cars were piled up in a bad wreck, which blocked the road eight hours. It is said that the freight had no signal out.

On the night of the 17th a passenger train on the Pittsburgh, Ft. Wayne & Chicago road ran into a freight train at Englewood, Ill. The engine and three cars were damaged, the engineer and fireman hurt.

On the morning of the 18th a freight train on the Central Railroad, of Georgia, ran into a passenger train in the yard at Macon, Ga. One car was upset and a passenger hurt.

On the afternoon of the 18th several cars of a freight train on the Chesapeake & Ohio road broke loose from a freight train near Waynesboro, Va., and ran back, down grade, into a pusher engine, which was going down also. The engine and two cars were badly broken.

On the 19th a freight train on the Denver & Rio Grande road ran into the rear of another freight near Denver, Col., wrecking three cars, killing one trainman and injuring two others fatally.

On the evening of the 19th a freight train on the Wabash, St. Louis & Pacific road ran into the rear of another freight which was stalled on a grade near Riverton, Ill., wrecking several cars. The first train, it is said, had no signal out.

On the night of the 21st a freight train on the New York & New England road ran over a misplaced switch and into another freight standing on a siding at Vernon, Conn. An engine and several cars were badly damaged.

On the morning of the 23d a passenger train on the Pennsylvania Railroad ran into the rear of a freight train which had stopped at Mineral Point, Pa. The engine was upset and badly broken and the caboose wrecked. The engineer, fireman, a brakeman and a passenger were hurt.

Very early on the morning of the 24th a freight train on the New York Central & Hudson River road ran into the rear of another freight which had stalled near Clyde, N. Y., wrecking two cars. The wreck caught fire and was burned up. The conductor was caught in the wreck of the caboose, and was burned to death.

On the morning of the 24th a passenger train on the Olean, Bradford & Warren road ran into the rear of a freight train near Tarport, Pa., wrecking several cars.

On the morning of the 25th a freight train on the Lake Shore & Michigan Southern road ran over a misplaced switch at Rockport, O., and into another freight train standing on a siding, doing much damage.

On the morning of the 26th a passenger train on the Manhattan Elevated road ran over a misplaced switch and into another passenger train at the Battery station in New York. One engine and one car were damaged.

On the morning of the 26th a freight train on the Cincinnati, Indianapolis, St. Louis & Chicago road ran into a preceding freight near Lawrenceburg, Ind., wrecking four cars and killing a tramp who was stealing a ride.

On the 26th a freight train on the Chicago & Alton road ran over a misplaced switch and into another freight standing on a siding at Lawndale, Ill., damaging an engine and five cars and killing the engineer.

On the morning of the 27th a freight train on the New York Central & Hudson River road ran into a preceding freight near Brighton, N. Y., throwing several cars over on the other tracks.

A minute later an east-bound freight ran into the wrecked cars on its track, breaking them badly. The wreck caught fire and five cars were destroyed.

On the morning of the 28th a freight train on the New York Central & Hudson River road ran into another freight in East Rochester, N. Y. An engine and three cars were damaged.

On the night of the 30th the pay train on the Union Pacific road ran into the rear of a freight train near Ft. Steele, Wy., damaging the engine and several cars, killing three trainmen and injuring four others.

On the morning of the 31st a freight train on the Richmond, Fredericksburg & Potomac road ran into a preceding freight near Potomac, Va., wrecking an engine and several cars, and injuring the engineer.

On the 31st a freight train on the Scioto Valley road ran into the rear of a construction train near Hanging Rock, O., wrecking the caboose, killing two and injuring five laborers.

On the afternoon of the 31st a freight train on the New Haven & Northampton road broke in two near Cheshire, Conn., and the two sections ran together, breaking one car.

BUTTING COLLISIONS.

On the morning of the 4th there was a butting collision between two freight trains on the Mobile & Ohio road near Lockhart, Miss., by which both engines and several cars were badly broken.

On the evening of the 5th there was a butting collision between a freight train and a yard engine on the Chicago, Milwaukee & St. Paul road in Milwaukee, Wis. Both engines were badly broken and three trainmen hurt.

On the morning of the 6th there was a butting collision between two freight trains on the Chicago, Milwaukee & St. Paul road near McGregor, Ia., wrecking both engines and 15 cars and injuring a fireman.

On the 5th there was a butting collision between two freight trains on the Chicago, Rock Island & Pacific road near Davenport, Ia., damaging both engines and several cars.

On the night of the 6th there was a butting collision between two passenger trains on the Wilmington & Weldon road near Faison, N. C. Both engines were badly broken.

On the night of the 7th there was a butting collision between two freight trains on the Chicago, Milwaukee & St. Paul road near Brownsdale, Minn., damaging both engines and several cars.

On the 13th there was a butting collision between two freight trains on the East Tennessee, Virginia & Georgia road near Rome, Ga. Both engines were badly broken.

On the afternoon of the 13th there was a butting collision between a freight and a coal train on the Cleveland, Tuscarawas Valley & Wheeling road near Canal Fulton, O. Both engines and several cars were wrecked.

On the afternoon of the 13th there was a butting collision between two freight trains on the Lehigh Valley road near Pattenburg, N. J. Both engines were damaged and an engineer hurt.

On the morning of the 16th there was a butting collision between two switching trains on the Louisville & Nashville road in the yard at Nashville, Tenn. There was a dense fog at the time.

On the morning of the 16th there was a butting collision between a Richmond & Petersburg freight train and a Norfolk & Western yard engine in Petersburg, Va. Both engines were damaged.

Very early on the morning of the 20th there was a butting collision between two freight trains on the New York, Lake Erie & Western road near Goshen, N. Y., by which both engines and several cars were wrecked. Trains were using only one track at this point on account of a wreck on the other track, and it is said that a flagman signaled both trains to move at the same time.

On the morning of the 20th there was a butting collision between two freight trains on the Detroit, Lansing & Northern road near Howell, Mich. Both engines and 20 cars were piled up in a bad wreck.

On the morning of the 21st there was a butting collision between two freight trains on the Charleston & Savannah road near Adams Run, S. C. Both engines and both mail cars were wrecked, a fireman was killed, an engineer and a conductor hurt. A mail clerk was also fatally hurt and three others less severely injured. The trains had orders to pass at Adams Run, but one of them did not obey, but went on.

On the night of the 26th there was a butting collision between two freight trains on the Lake Shore & Michigan Southern road near Sturgis, Mich. Two engines and 15 cars were wrecked. The accident is said to have been caused by an operator's mistake.

CROSSING COLLISIONS.

On the morning of the 3d a New York, Chicago & St. Louis construction train ran into an Ashtabula & Pittsburgh freight at the crossing near Ashtabula, O. Both engines were damaged.

On the morning of the 13th a freight train on the South Carolina road ran into a Charleston & Savannah passenger train at Seven Mile Crossing, S. C., wrecking one car badly. The engineer, fireman and a passenger were hurt. There was a dense fog at the time. The passenger train had stopped before crossing, and the conductor went ahead, but did not see or hear the approaching train. It does not appear that there were any signals.

On the night of the 13th a Pittsburgh, Cincinnati & St. Louis freight train ran into a Belt road freight just outside of Indianapolis, Ind., and several cars were wrecked.

On the morning of the 14th a Lake Shore & Michigan Southern freight train ran into a Baltimore & Ohio freight at the crossing at Miller, Ind. Several cars were wrecked and a brakeman hurt.

DERAILMENT, BROKEN RAIL.

On the afternoon of the 2d a passenger train on the Connecticut River road was thrown from the track near Greenfield, Mass., by a broken rail. The engineer and a car were slightly damaged and a brakeman hurt.

On the afternoon of the 9th three cars of a freight train on the Delaware Western road were thrown from the track on a bridge at Yorklyn, Del., by a broken rail, and went over the bridge into Red Clay Creek. A brakeman was hurt.

On the morning of the 13th a freight train on the Chicago, Milwaukee & St. Paul road was thrown from the track near Tomah, Wis., by a broken rail, and nine cars were wrecked. A brakeman was killed.

On the morning of the 17th a freight train on the Chicago & Northwestern road struck a broken rail near Glenbeulah, Wis., and the caboose was thrown from the track and down a bank. A passenger was hurt.

On the morning of the 23d a freight train on the Chicago & Northwestern road struck a broken rail near Fulton Junction, Ia., and 25 cars were piled up in a bad wreck.

On the morning of the 25th a passenger train on the Pennsylvania Railroad was thrown from the track on the bridge over the Hackensack River near Jersey City, N. J., and two cars were partially upset. The accident is said to have been caused by a broken rail.

On the morning of the 27th three cars of a freight train on the Chicago, Milwaukee & St. Paul road were thrown from the track near Strawberry Point, Ia., by a broken rail. A brakeman was killed and three hurt.

DERAILMENT, BROKEN JOINT.

On the morning of the 30th a passenger train on the Boston, Lowell & Concord line was thrown from the track at Nahor's Crossing, N. H., by a broken rail-joint. The engine ran upon rocks by the track and was badly damaged. The conductor and a brakeman were hurt.

DERAILMENTS, BROKEN BRIDGE.

On the morning of the 2d a passenger train on the Boston & Maine road broke through an iron bridge over a highway at Cole's Corner, near Wells, Me. The two engines and two cars passed over safely, but the postal car, smoking car and two passenger cars went down into the road. The wreck caught fire and was entirely destroyed. One man was killed, one fatally hurt and 75 others more or less injured, most of them slightly, nearly all being able to get out of the wreck before the fire had gone far. The bridge was of 56 ft. span, built by the New England Bridge Company in 1872, and had been inspected and pronounced safe a short time before. The investigation seems to indicate that an axle broke under the third car, throwing it down on the floor, and breaking down the bridge. The coroner's jury recognized this proba-

bility and also found that the iron in the bridge was either defective or had crystallized from long use.

On the afternoon of the 14th an iron bridge on the Chicago & Alton road, over Salt River, near Mexico, Mo., gave way under a freight train, and 11 cars went down and were wrecked. It appears that a car jumped the track and struck the bridge, knocking it down.

DERAILMENTS, SPREADING OF RAILS.

On the afternoon of the 5th the engine and several cars of a freight train on the Wabash, St. Louis & Pacific road were thrown from the track at Hadley, Ind., by the spreading of the rails. A brakeman was killed.

On the night of the 8th a freight train on the Wabash, St. Louis & Pacific road was thrown from the track near Moberly, Mo., by the spreading of the rails.

On the morning of the 9th the engine of a construction train on the Rochester & Pittsburgh road was thrown from the track at Rock Glen, N. Y., by the spreading of the rails.

On the morning of the 20th a freight train on the Jacksonville, Pensacola & Mobile road was thrown from the track near Ellaville, Fla., by the spreading of the rails. A brakeman was killed.

DERAILMENTS, BROKEN WHEEL.

On the night of the 1st three cars of a freight train on the Chicago, Milwaukee & St Paul road were thrown from the track on a trestle near La Crescent, Minn., by a broken wheel.

On the afternoon of the 7th some cars of a freight train on the New York, Lake Erie & Western road, were thrown from the track near Narrowsburg, Pa., by a broken wheel.

On the afterhoon of the 16th a passenger train on the Chicago, Milwaukee & St. Paul road was thrown from the track near Lansing, Ia., by a broken wheel, and two cars were wrecked. A child was killed, a brakeman and 19 passengers hurt. The wrecked cars went down a bank and one of them upset.

On the 28th 16 cars of a coal train on the Syracuse, Binghamton & New York road were thrown from the track near Syracuse, N. Y., by a broken wheel. A brakeman was hurt.

DERAILMENTS, BROKEN AXLE.

Early on the morning of the 20th ten cars of a freight train on the Lehigh Valley road were thrown from the track near Rockport, Pa., by a broken axle. A brakeman was killed.

On the afternoon of the 21st some cars of a freight train on the New York, New Haven & Hartford road were thrown from the track in Hartford, Conn., by a broken axle.

On the evening of the 22d nine cars of a freight train on the Pennsylvania Railroad were thrown from the track near Paoli, Pa., by a broken axle.

DERAILMENTS, LAND-SLIDES AND WASH OUTS.

On the night of the 15th a passenger train on the Virginia Midland road ran into a land-slide near Faber's Mill, Va., and the engine was thrown over, killing the engineer and injuring the fireman.

On the 16th a construction train on the Georgia Pacific road went into a washout near Columbus, Miss., wrecking the engine and injuring the engineer.

DERAILMENTS, SNOW.

On the evening of the 23d a snow-plow on the Monadnock road ran off the track in a drift near Rindge, N. H., blocking the road all night.

On the morning of the 30th a snow-plow attached to a passenger train on the St. John & Mains road ran off the track in a drift in Carleton, N. B., delaying the train an hour.

DERAILMENTS, ACCIDENTAL OBSTRUCTION.

On the 9th a passenger train on the East Tennessee, Virginia & Georgia road struck a rock which had rolled on the track in a cut near Bristol, Tenn., and the engine and one car were thrown from the track.

On the morning of the 18th four cars of a freight train on the Chicago, St. Paul, Minneapolis & Omaha road were thrown from the track near Worthington, Minn., by a large stone which fell from a flat car upon the rails.

On the morning of the 27th a freight train on the Baltimore & Ohio road struck a large stone which had rolled upon the track in cut near Fairhope, Md., and the engine was thrown over on its side and wrecked. The engineer was fataly injured, the fireman and brakeman badly hurt

On the morning of the 31st the snow-plow, engine and one car of a passenger train on the Virginia & Truckee road were thrown from the track near Washoe, Nev., by a loose plank in a road crossing. The engine upset and was badly broken. The engineer, fireman and express messenger were hurt, and three Indians, who were riding on the tender, were killed.

DERAILMENTS, MISPLACED SWITCH.

On the afternoon of the 3d a car of a passenger train on the New York, Lake Erie & Western road was thrown from the track at Dayton, N. Y., by a misplaced switch.

On the evening of the 4th, as a passenger train on the Manchester & Lawrence road was switching in the yard at Manchester, N. H., the engine was thrown from the track by a misplaced switch and ran down over a bank-wall against some coal cars. The train followed and the baggage car was wrecked.

On the morning of the 11th five cars of a freight train on the Oregon & California road were thrown from the track in Portland, Or., by a misplaced switch. A brakeman was hurt.

On the afternoon of the 11th the engine and several cars of a freight train on the Wabash, St. Louis & Pacific road were thrown from the track in Litchfield, Ill., by a misplaced switch.

On the 12th a passenger train on the Cincinnati, Wabash & Michigan road was thrown from the track at Goshen, Ind., by a misplaced switch.

On the 13th the engine of a passenger train on the Chicago & Northwestern road was thrown from the track in Evanston, Ill., by a misplaced switch.

On the night of the 13th a freight train drawn by three engines on the New York Central & Hudson River road was thrown from the track at Fox Ridge, N. Y., by a misplaced switch. The three engines and 30 freight cars were piled up in a very bad wreck, injuring one engineer fatally, another engineer and two firemen badly.

On the 14th the engine and two cars of a passenger train on the Chicago, Milwaukee & St. Paul road were thrown from the track at Crossley, Ill., by a misplaced switch.

On the afternoon of the 18th two cars of a passenger train on the New York, Lake Erie & Western road were thrown from the track at Turners, N. Y., by a misplaced switch.

On the afternoon of the 27th the engine of a passenger train on the Louisville & Nashville road was thrown from the track in Nashville, Tenn., by a misplaced switch.

MALICIOUS DERAILMENTS.

On the night of the 11th a passenger train on the Pittsburgh, Cincinnati & St. Louis road was thrown from the track near New Paris, O., where a rail had been purposely misplaced. The engine and one car were wrecked and the fireman badly hurt.

On the evening of the 28th the engine and one car of a passenger train on the St. Louis, Iron Mountain & Southern road were thrown from the track near Piedmont, Mo., where a rail had been removed from the track by persons unknown.

UNEXPLAINED DERAILMENTS.

On the 2d a car of a freight train on the Cincinnati, Wabash & Michigan road ran off the track on a bridge near Wabash, Ind., and fell into the river.

On the morning of the 3d the engine and several cars of a freight train ran off the track near Hannibal, Mo., on the St. Louis, Keokuk & Northwestern road.

On the evening of the 3d two cars of a passenger train on the Houston & Texas Central road ran off the track near Austin, Tex., and upset, injuring the sleeping car porter.

On the evening of the 5th four cars of a freight train on the New York, Lake Erie & Western road ran off the track in Canaseraga, N. Y., and were wrecked.

On the morning of the 7th several cars of a freight train on the Richmond, Fredericksburg & Potomac road were thrown from the track near Massaponax Bridge, Va., blocking the road several hours.

On the morning of the 7th several cars of a freight train on the Pittsburgh & Lake Erie road ran off the track near Homewood, Pa. A brakeman was hurt.

On the morning of the 7th the engine and several cars of a freight train on the Peoria, Decatur & Evansville road ran off the track in Lincoln, Ill., and were damaged.

On the morning of the 11th the engine and three cars of a freight train on the Buffalo, Pittsburgh & Western road were thrown from the track near Sherman, Pa., and the engine was badly broken.

On the morning of the 11th a freight train on the Delaware, Lackawanna & Western road ran off the track in Syracuse, N. Y., blocking the road several hours.

On the morning of the 13th a freight train on the Wabash, St. Louis & Pacific road ran off the track near Flat Rock, Ill. The conductor was killed.

On the morning of the 13th the engine of a freight train on the New Haven & Northampton road ran off the track in Northampton, Mass., delaying trains an hour.

On the evening of the 15th a freight train on the Illinois Central road ran off the track near Ramsey, Ill., wrecking nine cars. A conductor and a brakeman were hurt.

On the morning of the 19th two cars of a freight train on the Peoria & Farmington road ran off the track near Peoria, Ill., and were wrecked.

On the evening of the 19th the engine and three cars of a freight train on the Pittsburgh, Cincinnati & St. Louis road ran off the track in Indianapolis, Ind., doing some damage.

On the morning of the 19th a freight train on the Toledo, Delphos & Burlington road ran off the track at Washington Court House, O., blocking the road several hours.

On the night of the 19th a freight train on the New York, Lake Erie & Western road ran off the track near Goshen, N. Y., and several cars went down the bank and were wrecked. An oil car caught fire and the wreck was destroyed.

On the afternoon of the 20th a passenger train on the Northern Pacific road ran off the track near Spirit Wood, Dak., and the whole train went into the ditch. Five passengers were slightly injured.

On the night of the 20th a passenger train on the Toronto, Grey & Bruce road ran off the track near Owen Sound, Ont., breaking four cars and badly injuring seven passengers.

On the morning of the 21st several cars of a repair train on the Hartford & Connecticut Valley road ran off the track at Rocky Hill, Conn., blocking the road a short time.

On the 21st a log train on the Flint & Pere Marquette road ran off the track near Clare, Mich., and 18 cars went down a bank and were wrecked.

On the morning of the 23d the engine of a freight train on the Sandy River road ran off the track on a trestle near Phillips, Me., and was wrecked, injuring four men.

On the 23d a freight train on the Atchison, Topeka & Santa Fe road ran off the track near Cedar Junction, Kan., and nine cars were wrecked.

On the morning of the 24th a freight train on the New York & Harlem road ran off the track near Kensico, N. Y., doing some damage.

On the 24th five cars of a freight train on the Northern Pacific road ran off the track near Jamestown, Dak., and went down a bank.

On the night of the 27th a freight train on the Southern Pacific road ran off the track near San Gorgonio, Cal., wrecking several cars, injuring a brakeman and two immigrant passengers.

On the morning of the 30th the engine and six cars of a freight train on the Wisconsin Central road ran off the track near Colby, Wis., and were badly broken. The conductor was hurt.

On the afternoon of the 31st a freight train on the Chicago & Northwestern road ran off the track near Oakfield, Wis., 22 cars going into the ditch.

On the evening of the 31st three cars of a freight train on the New York Central & Hudson River road ran off the track at Mabees, N. Y., and were wrecked.

BOILER EXPLOSIONS.

On the afternoon of the 3d the engine of a freight train on the Savannah, Florida & Western road exploded its boiler near Pelham, Ga. The engine was torn to pieces, the fireman and a brakeman killed, the engineer badly hurt. It is said that the crown-sheet was found to be very badly corroded.

On the afternoon of the 9th the engine of a passenger train on the Illinois Central road exploded its boiler when near Hyde Park, Ill, destroying the engine. The engineer, fireman and a boy were hurt.

OTHER ACCIDENTS.

On the morning of the 2d the engine of a passenger train on the Western Maryland road broke a parallel rod when near Westminster, Md. The loose end tore up one side of the cab, injuring the fireman.

Early on the morning of the 14th a car in a freight train on the New York Central & Hudson River road caught fire when near Chili, N. Y., and a grain car and an oil tank were burned up. The burning oil destroyed the track for some distance.

This is a total of 137 accidents, by which 41 persons were killed and 198 injured. Twenty-five of the killed and 67 of the injured were railroad employés, 16 of the killed and 131 of the injured being passengers.

As compared with January, 1881, the month shows a decrease of 84 accidents, but an increase of 11 killed and 16 injured. The numbers for the month were greater than the average for the 12 months of last year by 16 accidents, 6 killed and 59 injured.

The Late John Cooke.

Mr. John Cooke, well and widely known to railroad men as Superintendent and afterward President of the Danforth Locomotive Works at Paterson, N. J., died at his residence in that city Feb. 20. We take the following from the Paterson *Press*, whose editor was Mr. Cooke's intimate friend:

Mr. Cooke was 58 years of age. He was born in Montreal, Canada, and when quite small removed to Albany, N. Y., with his father. From Albany, where he spent five years of his boyhood, he went to Matteawan, in Dutchess County. Here he developed a taste for mechanics, and although still attending school, he frequently visited the cotton mill at this place and watched the workings of the machinery with an anxious eye. He was hardly 15 years of age when he came to Paterson and entered the employ of Rogers, Ketcham & Grosvenor, in which establishment his father, Mr. Watts Cooke, Sr., was the head pattern maker. Here he spent several years learning the trade of pattern maker and spent his evenings in hard study. He had acquired a good education while at school. He had never graduated from any college, but he had an education somewhat better than a common school education, and he was considered better informed than the rest of the young men employed about him in the shop. He loved mathematics and made this an especial study, although he also devoted a great deal of time to the reading of ancient history, of which he was very fond. At the age of 21 he was placed in charge of the establishment of Rogers, Ketcham & Grosvenor, and continued in that position until 1852. In that year a proposition was made to found the firm of Danforth, Cooke & Co. Although the old firm offered him a large interest in their own establishment, he preferred to cast his fortunes with the new enterprise. After working until 1866 Mr. Cooke concluded that his years of labor had entitled him to some rest. He had often had a desire to visit Europe and other countries, not so much out of curiosity or the other pleasures which people see in traveling as to gratify a desire to see the countries he had read so much about and prove by personal observation the truth of the histories he had read. He spent three years abroad and during that time not only visited all the countries in Europe but also paid a visit to Palestine and took a trip up the Nile. Having satiated his desire for travel, he returned to this country and upon the retirement of Mr. Charles Danforth from the presidency of the Danforth Locomotive Works he took that position and held it to the time of his death.

Politically Mr. Cooke was always a strong Republican, and he was ever ready to defend the tenets of that party. He lent his aid to the establishment of the first Republican newspaper in this city, and although he was always willing to contribute to the success of the party, he did not like public life, and it was only with difficulty that he was persuaded to accept the offices he held. He was once elected Alderman from the Eighth Ward, and was one of the few Republicans who were ever elected from that ward. In 1864 and 1865 he was President of the Board of Education, which ended his public career.

When he was about 18 years of age he joined the old congregational Church, but subsequently united with the Presbyterian faith, in which he died. He was a member of the Second Presbyterian Church, and for a number of years held the position of Superintendent of the Sunday school. He was on the building committee that had in charge the erection of the present church, and was in other ways identified with the growth of Presbyterianism in this city.

He was the oldest of four brothers. His father, as already stated, was engaged for a number of years with Rogers, Ketcham & Grosvenor, and was otherwise identified with the iron industry in this city. William Cooke, next in age to him, is in the machinery supply business in New York, being the head of the house of William Cooke & Co. Watts Cooke is well known to our readers as the President of the Passaic Rolling Mill Co., and James, the youngest of the three brothers, is also well known on account of his connection with the establishment of Danforth, Cooke & Co. Mr. James Cooke returned from the Adirondacks on Saturday, summoned back to Paterson to the bedside of his dying brother. Deceased was the father of five children. Mrs. Fayerweather is the wife of the Secretary of the Passaic Rolling Mill Co.; Mrs. Beam is the wife of the rising young lawyer; John S. Cooke has had charge of the establishment of Danforth, Cooke & Co. since his father has been confined to his house; Frederick and Charles, the two youngest children, are still at school. Mr. Cooke married a daughter of Mr. William Swinburne, the City Comptroller and father of the cashier of the First National Bank.

Mr. Cooke's ailment was an enigma to the attending physicians, Drs. Blundell and Marsh, of this city, and Dr. Flint, of New York. The failed to find any organ in the body that was not in perfect health. The theory of the physicians was that death was caused by a general exhaustion of the vital forces and was not attributable to any specific disease.

Such was the life of one of Paterson's foremost and most enterprising citizens. With the exception of three years devoted to travel, he worked hard every day. There was nothing particularly brilliant about his career, but his work was of the kind which produced uniformly good results. One year did not excel the other, but the whole of the 43 years he spent in Paterson might serve as a model for our young men. It was his ambition to rise by steady and untiring industry and application in the sphere of life he had selected to move in, and it was due to his energy and his hard work that he reached the topmost round of the ladder he began to ascend when he came to Paterson and at the workman's bench began to learn his trade. He was thorough in all he undertook, and he encouraged true merit wherever he found it. There are to-day many persons in this city who owe the enviable positions they hold in life to the benevolence and kind aid of Mr. John Cooke.

Railroad Traveling in India.

A correspondent of the New York *Times*, writing from Central India, Dec. 20, is very favorably impressed by the accommodations afforded on an Indian railroad, as appears from the following quotation:

Since writing from Poonah, on the 13th, I have taken a flight of more than 600 miles into the heart of India, and have had a chance of seeing for myself—so far, at least, as an unbroken run of 28 hours could do—what East Indian railway traveling, so differently represented by different people, is really like. My own experience of it recalls Thackeray's famous story of the English tourist, who, having gone on board of a Dutch canal-boat to dine, was so delighted with his fare that he at once took up his quarters on the boat, and oscillated between Rotterdam and the Hague for five years, like a canal-bred Flying Dutchman, without ever coming ashore, till at length, having learned that his aquatic paradise was about to be superseded by the opening of a new railway, he jumped overboard and drowned himself. The attractions of the "G. I. P." (Great Indian Peninsular) are perhaps not quite suffi-

cient to make any passing traveler enlist upon it as a conductor or engine driver for the term of his natural life; but it is certainly the most comfortable railway which I have yet met with in any part of the world. True, it can hardly be said to to deserve a prize for remarkable speed, its average pace being about 20 miles an hour, and delays of half an hour or three-quarters at the larger stations being apparently quite in order. But, despite the slowness of the journey, the countless appliances of comfort provided for it might almost tempt one to wish it longer, like the model schoolboy who wrote home to his mother that he enjoyed his lessons so much as quite to dread the approach of the holidays.

The "fast" mail train—so-called on the principle that "the one-eyed man is king among the blind"—leaves Bombay at 6:30 p. m., Madras time, an addition, the full atrocity of which can only be appreciated by those who are aware that on the 1st of the present month Bombay suffered the unparalleled indignity of being forced to set its time by that of Madras, an indignity faintly conceivable by imagining Chicago compelled to regulate its clocks by those of St. Louis. According to Madras time, then, I rattle up to the queer little railway depot at Bhori Bunder, which, though it resembles nothing so much as a disused freight shed, will probably represent the railroad enterprise of Bombay for some time yet, the stately colonnade of pillared arches which is rising beside it having been in progress for three or four years already, and seeming likely enough to go on for three or four more.

Scarcely have I set foot on the half-dozen steps of rickety plank leading up to the platform, when six or seven white-frocked and brown-limbed coolies, looking very much like cigars wrapped in paper, are already fighting for my modest "Gladstone" bag, which the Conservative Captain of our steamer irreverently declared to be rightly named, inasmuch as it had next to nothing in it while seeming to hold a great deal. Plunging headlong into a kind of wooden horse-box to the left, divided down the middle by a plank partition with a hole in it, I clutch the ticket and the handful of Indian silver passed out to me through the hole by a lean brown hand, and rush out again to find the coolie fight just ended, and my bag in the hands of the conqueror, a tall, gaunt Byculla man with two perpendicular scarlet lines on his low, dusky forehead, marking the particular caste to which he belongs. Swinging along the side of the train with the bag on his head, he has opened the door of a first-class compartment, stowed my Gladstone in the snuggest corner, and come out again to adjust his many-folded turban before I can catch him up, and now receives, with a grateful salaam, the two cents which he considers his just remuneration.

There are still a few minutes left before the starting of the train, and one cannot employ them better than in studying the component parts of a tableau which is the queerest imaginable parody of the ordinary railway station panorama in Europe or America. Oranges, apples and bananas are being peddled in all directions, but the brown, bare-limbed, white-mantled, turbaned fellows that carry them look like figures out of a fancy ball. A hand as black and gaunt as a vulture's claw thrusts into your face a bundle of English newspapers, and a shrill voice utters a fluent recommendation of them in Hindustani. A lithe native conductor, whose white jacket and spotless pith helmet contrast strangely with his omelet-colored face, comes round to "punch in the presence of the passenger," a ticket having under its English superscription a row of nondescript objects very much like broken toasting-forks, but being in reality a literal translation of it in genuine Hindu characters.

But now the last bell rings, the English head conductor, whose smart white jacket and tall pith helmet give him quite a military look, blows his shrill whistle, the train stirs its creaking joints into action, and we are off. It being already too dark to see anything of the surrounding country, the best thing to do is to compose one's self to sleep, a thing much easier to do on a British railway out here than on one at home. Who does not know the accumulated miseries of a long night journey in an ordinary English railway car? The ceaseless change from one position to another, each in turn worse than the last; the frantic, fruitless effort to stow your feet anywhere out of the way, until the mere existence of those useful members seems an overwhelming personal wrong; the deep, rhythmical, uninterrupted snoring of your companions, who, of course, protest next morning that they have never closed their eyes, and lay all the blame of the "deep-chested music" upon your innocent and sleepless self; the sudden irruption of the conductor with a seemingly unnecessary demand for your ticket just as you are at length beginning to doze off; the unwashed, uncombed, uneverything feeling of the early morning inspiring you with a temper of mind to which that of Cain toward Abel was saintly. On the Anglo-Indian railways it is far otherwise. The first-class cars are tolerably empty at this season, except during the Christmas week itself, and the accommodation is simply faultless. Each car contains two compartments, furnished with a cushioned settee down either side, and a third crosswise along one end, the other end being occupied by a lavatory and shower-bath, both excellent of their kind. Each settee has a folding back, which, when unfolded and secured by hooks hung from the ceiling, turns the sofa into a regular sleeping-berth. You unstrap your rug—for the nights are pretty cold at this season—pull the screen over the lamp, shut the windows to keep out as much as possible of the all-pervading dust, and sleep soundly till morning, when, after a good shower-bath and a cup of piping hot tea, you feel ready for anything.

Imperfections of the Block System on Crowded Lines.

The occurrence of three serious accidents within a very short period on the metropolitan railways in the north of London has directed attention very forcibly to the system adopted on metropolitan railways by those who have the management of the traffic on them. The first of these accidents took place on the 10th of December at Canonbury, and was due to the complete failure of the block system, as interpreted by a signalman of many years' experience. The second happened at Hornsey on Wednesday week, on the Great Northern line. A train from Victoria, running over the London, Chatham & Dover Company's lines and the Metropolitan Railway, continued its journey from King's Cross to Enfield, arriving at Hornsey at 5.27 p. m., or three minutes late. While standing in the station it was run into by a following train from Moorgate street. This train ran past all the signals intended to protect Hornsey, because the fog was so dense that the driver could not see them, and no fog signals had been put down because the fog came on, it is said, so suddenly that there was not time to get men to place them on the rails. Here again the block system failed. The third accident took place on Saturday night on the North London line between Old Ford and Bow. A coal train left Poplar for Brent at 10.10 p. m., and while running it is said that a draw-bar under one of the wagons broke. The long end of this bar dropped down and stuck in the sleepers, and lifted the wagon off the road; other wagons followed it, and in a few seconds both lines were obstructed. A passenger train traveling in the opposite direction ran into the *débris* and much damage was done. In all three cases lives have been lost. It does not appear quite so clear as is perhaps desirable that the coal wagon was thrown off by the breaking of the draw-bar. It is, indeed, possible that the wagon left the rails, and in doing so broke the bar; but this is beside the question. Here we have another example of the failure of the block system to protect the lives of passengers. The three cases of failure were all different, and each illustrated a peculiar form of danger. The first showed how easily a trained signalman may make a mistake; the second illustrated the incompetence of the system to deal with sudden changes in atmospheric conditions; and the third shows that the system being incapable of recognizing any form of obstruction on more lines than one, fails to deal with an obstruction on the up as well as the down road. Thus tested in three different ways, the system breaks down. The question remains, is it possible to so modify and supplement it that it will prove efficient under all conditions?

We may at the outset admit that on the whole the system works well in the country, but it does so only because it can be supplemented. Once the local metropolitan system is cleared, trains succeed one another only at comparatively long intervals. Thus, on any main line, and at a distance of say thirty miles from London, it will be found that intervals of from fifteen to thirty minutes intervene between the passage of any two trains over a given spot. At certain periods of the day the intervals may be still longer. Under these conditions there is time to provide for contingencies. Thus, for example, if a signalman made a mistake such as that which caused the Canonbury accident, the signalman at the receiving station would, when he found the other man insisted on sending on trains, have had time to dispatch a man with a red flag to stop them, and to take other precautions sufficiently obvious. If a fog came on suddenly as in case No. 2, there would have been time after the arrival of one train in the station to send a man back with fog-signals to stop a following train; and if both lines were blocked, as in case No. 3, then the guard of the tail end of the goods train could run forward with his lamp and fog signals and stop a coming train. Now in the conduct of metropolitan traffic there is no time to supplement the block system. Trains follow each other at intervals of two or three minutes, and when the semaphore signal fails to do its work there is nothing else to fall back upon. Can anything be provided which can be used with the ordinary semaphore arm or immediately afterwards to supplement and enforce its indications?

Those who will say yes are legion, but they are not men possessing a practical knowledge of the working of railways. Signal-makers, traffic managers, and station masters, to say nothing of signalmen, guards and engine-drivers, will all be slow to reply in the affirmative. There is much to be thought of which will not strike the unpracticed at first sight. Thus it is very difficult to see how the existing arrangements can be superseded without very much increasing the complication of a system which is incredibly complex as it is. However, it is not equally difficult to deal with all the three cases we have cited. For example, there are two ways of working semaphore signals, either or both of which would have prevented the accident at Hornsey, and both are in use. The first consists in fitting every semaphore post with a small steel plate or toe, which is turned across the rail when the signal is at danger. If the engine passes the signal it must run over the steel toe. There is no danger incurred in this, and it is impossible for either driver or stoker to escape the knowledge that they have passed across it. Running over the least obstruction, a spoonful of gravel on a rail, can be recognized at once on a foot-plate. The toe has been used experimentally for some time by Mr. Stroudley in the Brighton station yard, and with perfect success. There is, however, a yet simpler plan in use on several lines. This consists in placing a signal lamp low down on the semaphore post, that is to say, about on a level with a driver's eyes when he stands on the foot-plate, and this lamp is so arranged that the light beats full on the spectacle plate of the cab as the engine passes it. It is impossible in the densest fog on the darkest night to miss seeing a bright red light within 4 ft. of one's eyes. At Willesden Junction there is in use on some of the siding semaphores an arrangement under which a lamp well focussed throws its light on the arm of the semaphore, the lamp itself not being visible. It would be interesting to know how far such a system answers in a fog. Whether it does or not is, however, of little consequence, as the low signal can always be seen. It may, we think, be taken for granted that without the aid of any expensive appliances, or the introduction of any complication, or arrangements for the automatic placing of fog signals—for doing which dozens of patents have been taken out—it is possible to render the block system competent to contend with a fog. All that is needed is a lamp where it can be certainly seen, instead of being fixed 20 ft. or 30 ft. above the driver's head.

Turning to that class of failures represented by the accident, it is evident that here not the mechanism of a semaphore is in fault, but the intelligence which uses it. The only remedy for deficiences in the signalman must lie in supplementing, not the signaling apparatus proper, but his own intelligence. It is not likely that two men will break down although one does; but it is not therefore necessary or even at all advisable to put two men in the same box; on the contrary, they should be at opposite ends of the section to be protected. It has been proposed that each man should be able to lock the other's signals at danger, the locking bolts to be worked by electricity. We look on the idea with apprehension, knowing as we do how easily electrical apparatus can be put out of gear, and seeing that it would be next to impossible to adopt it without giving each man the means of shifting responsibility on to his fellow. By far the better system consists in doing what we have already suggested, namely, in the first place establishing telephonic communication between all signal boxes in large cities and their neighborhoods, and automically registering the time of reception and nature of every message sent by the bell signals. In this way, if a mistake was made by one man, it might be almost instantly rectified or explained to him by his fellow, while there could be no getting out of the responsibility thrown on the receiver and sender by the record against them. Furthermore, it is, we think, desirable that the precise number of strokes of the bell given and received should be recorded visibly to both men. This could very easily be done by fitting the bell with a dial like that of a clock, and one hand. The hand would always point to the number of blows given, just as the hand of a clock does to the number of the hour just struck. Mistakes are very easily made in counting numerous beats, as five for six, and it is as well that the chance of this occurrence should be eliminated from the system when it can be done without trouble or expense.

With the third and last class of accident the block system seems to be quite powerless to deal. There is no way conceivable in which it can be made to operate to stop a train already running on any given section. Everything in such a case depends on the presence of mind and bodily powers of the guards, drivers, or others in the train which has broken down. The only thing that it seems possible to do is to enable those close to the obstruction to make advancing trains aware of its existence without delay. Seconds very often in such cases represent lives. Each guard should be provided with the means of producing a very brilliant light. It matters nothing about its color. Chemists will find no difficulty in making what is wanted. A signal light of this kind could, if necessary, be fitted with a simple reflector, and being stuck in the ground at the rear of the broken-down train would be seen a long way off by an advancing driver. Two lights could be used, one to protect each road. The unusual glare would not fail to attract his attention. In the day time the light would be useless, but, on the other hand, he could, unless he was coming round a curve, see the obstruction a good way off, when he would, with the aid of a continuous brake, easily pull up his train. In tunnels the signal light would act admirably. Among the other advantages which it would possess, too, would be that of lighting up a wrecked train and enabling assistance to be rendered at once to the sufferers.

Summing up our conclusions concerning the conduct of metropolitan railway traffic, they may be thus explained. In the first place, a system of signaling which answers very well in the country, when the trains do not follow each other at very close intervals, is not sufficient to secure safety on metropolitan lines, where trains follow each other at intervals of less than five minutes. In the second place, London being liable to be suddenly visited by fogs, it is essential that fog-signals and the ordinary signals should be supplemented by what may be called glare signals close to the ground. It would not be difficult to make the same lamps illumine large boards carrying each a distinctive number which would indicate to a driver precisely where he was. Every engine ought, too, to be fitted with a speed indicator, which could convey useful information to a sharp man as to his whereabouts in thick weather. An instance occurred within our own experience when a driver ran nearly two miles on a wrong line without knowing it, in a fog, and had to back his train up to the junction from which he started. The fault lay with the signalman, who made a mistake about the train, which he could not see because of the fog, while he took three signal whistles for four. The driver accounted for his not arriving at a given station as soon as he expected on the theory that he was running slower than usual. He put on more steam so as make up for this, and so would have intensified an accident had one occurred. A speed indicator such as Stroudley's would have obviated all this. Thirdly, all signal-boxes within the metropolitan district should be coupled up on each line of railway by telephones, and all the bell instruments should be made self-recording. Fourthly, guard and driver should be provided with the means of making a very brilliant light which will burn in any weather for at least 10 minutes, or at all events for such a time as will enable a man to proceed to a reasonable distance to protect the broken-down train. And, lastly, we earnestly recommend the employment in the metropolitan district of none but the best signalmen, to whom liberal wages ought to be paid, while the hours of work should never exceed eight out of twenty-four. There is nothing exacting in any of the demands we make on metropolitan railway companies. No necessity is created for applying for help to outsiders. The outlay entailed will be small. Until, however, the suggestions we have made are put in practice, railway companies must not say that they have taken all possible precautions to protect the lives and limbs of their passengers.—*The Engineer, Feb.* 2.

Transportation in Congress.

In the House on the 21st:

Mr. Pound, from the Committee on Public Lands, reported a resolution calling on the Secretary of the Interior to report to the House the annual gross earnings and net earnings of the Central Pacific, the Kansas Pacific, the Union Pacific and the Central Branch of the Union Pacific railroads from the commencement of the operations of the same until the present time. Adopted.

The House then went into the Committee of the Whole on the Post-Office Appropriation bill. The clause under consideration was that appropriating $10,655,000 for transportation by railroad routes of the United States mails. There were three proposed amendments pending, the first being that offered by Mr. Robeson, providing that the mails shall be carried without extra charge upon the fastest trains run over the railroad by which they are carried whenever the Postmaster General shall deem it desirable. To this Mr. Cannon offered an amendment providing that if the railroad companies shall fail to carry the mails on their fastest trains their compensation shall be reduced 50 per cent. As a substitute for Mr. Robeson's amendment Mr. Holman offered a proviso that all land-grant railroads which have received in excess of 3,000 acres per mile shall receive only 50 per cent. of the compensation allowed to other railroad companies for carrying the mails.

Mr. Holman's substitute was rejected—65 to 89. Mr. Cannon's amendment was accepted by Mr. Robeson and Mr. Robeson's amendment, as thus amended, was agreed to—85 to 69.

RAILROAD LAW.

Mortgaged Stock.

A decision of great importance to business men and of interest to the general public was rendered by Chancellor Edwards on Friday, who wrote a long and careful opinion sustaining his view. The suit was brought by Samuel Spalding against E. H. Payne and E. P. Fontaine. Fontaine owned a large majority of the stock of the Louisville Transfer Company, and executed a mortgage to Spalding, his father-in-law, on 180 shares, to secure a debt of $4,200. The mortgage was recorded, but no transfer of the stock was made on the books of the corporation to Spalding, and Fontaine retained the certificates in his possession. Afterward Fontaine sold the stock to Payne, who had no knowledge of the mortgage. Payne took the certificates and had the stock transferred to him on the company's books. When Spalding discovered this transaction he brought his suit to have the sale of the stock set aside and his lien on the 180 shares enforced. A demurrer was filed to the petition, and the Judge sustained it, holding that Payne, who was an innocent purchaser, was not affected by the previous mortgage. The Chancellor alluded to the fact that a vast deal of the business now transacted with banks is done by the depositing of stocks and bonds as collateral, and if every time a man went to a bank with securities of this kind the bank officers had to stop until they made an examination of his title such transactions would be retarded and business stopped.—*Louisville Courier-Journal, Feb.* 5.

Law of Patents.

A correspondent who contributes to the New Haven *Journal and Courier* an interesting digest of the recent decision of the Supreme Court of the United States in the case of E. Miller & Company *vs.* The Bridgeport Brass Co., remarks that in that decision the Court has taken a new departure, so far as is known, unforeseen either by the bench or by the bar; the new point of departure being *laches* imputed to the applicant for want of due diligence in applying for his reissue.

"The record in the case, as it went up, was a clean one. It called for and has met a direct ruling. The Circuit Court found as a fact that 'the descriptive portion of the reissued specification does not substantially differ from the language of the descriptive portion of the original specification.'

"The mistake was in the claim of the original to a combination of A, B and C, whereas the claim should have been to two independent features—*i. e.*, the combination of A and B as well as the combination of A, B and C.

"The Supreme Court does not go so far as to insist that such mistake in the claim can in no case be corrected. It says: 'If the mistake is apparent on the face of the patent and can be discovered as soon as that document is taken out of its envelope and opened,' the patentee may at once return it to the Patent Office and say, 'I omitted this,' or 'My solicitor did not understand that,' and his application may be entertained and on a proper showing a correction made. But if he omits to do this 'his omission to claim other devices or combinations apparent on the face of the patent is in law a dedication to the public of what is not claimed. It is a declaration that that which is not claimed is either not the patentee's invention, or, if his, he dedicates it to the public. * * If two years' public enjoyment of an invention with the consent and allowance of the inventor is evidence of abandonment and a bar to an application for a patent, a public disclaimer in the patent itself should be considered equally favorable to the public. Nothing but a clear mistake or inadvertence and a speedy application for its correction is admissible when it is sought merely to enlarge the claim.'

"But there is in this case another new departure. It has been uniformly held by the Supreme Court, as well as in all the circuits, that the jurisdiction of the Commissioner of Patents was exclusive over the question of fact, whether the original patent was or was not inoperative by reason of inadvertence or mistake, and that his judgment was so far final as to leave open to the courts only the question whether the two patents were for the same invention. But the Supreme Court says: 'In reference to reissues made for the purpose of enlarging the scope of the patent the rule of *laches* should be strictly applied; and no one should be relieved who has slept upon his rights, and has thus led the public to rely on the implied disclaimer involved in the terms of the original patent. And when this is a matter apparent on the face of the instrument upon a mere comparison of the original patent with the reissue, it is competent for the courts to decide whether the delay was unreasonable and whether the reissue was therefore contrary to law and void. We think that the delay in this case was altogether unreasonable, and that the patent could not lawfully be reissued for the purpose of enlarging the claim and extending the scope of the patent.'

"The practical effect of this decision would seem to be that all reissued patents with claims broader than those of the original patents are void, unless the patentee has used 'due diligence' in the correction of an 'actual mistake,' and that two years from the date of the original patent is the limit within which he can be permitted to raise the question of due diligence. Beyond that period the law assumes a dedication to the public of every feature of the original patent not included in its claims.

"It is true the decision applies this rule in terms only to patents where the mistake is apparent on the face of the original patent. But reissues have always been held void if, upon comparison, the claimed mistake was not apparent on the face of the original patent.

"There is much force and too much truth in the Court's recital that 'These after-thoughts developed by the subsequent course of improvements, and intended by an expansion of claims to sweep into one net all the appliances necessary to monopolize a profitable manufacture are obnoxious to grave animadversion. * * * The evils which have grown from the practice have assumed large proportions. Patents have been so expanded and idealized years after their first issue that hundreds and thousands of mechanics and manufacturers who had just reason to suppose that the field of action was open have been obliged to discontinue their employments or pay an enormous tax for maintaining them.'

"But it is to be regretted that the Supreme Court has reserved its announcement of what must now be accepted as the law upon this subject so long that the remedy it prescribes for the evils which have grown up under the sanction of its previous decisions must impair large amounts of invested capital."

New Jersey Railroad Law.

The following bill last week passed both houses of the New Jersey Legislature:

Be it enacted, That in all cases where the bonds of any corporation created by or organized under any act of the Legislature of this state, have been heretofore issued, and which bonds are due or about to become due, or may be paid by such corporation at its option, it shall be lawful for the board of directors of such corporation to increase its capital stock in order to provide means for the payment of such bonds, and for that purpose to issue and sell the shares of such increase of capital stock for cash only, and in such manner as they deem best, at a price not below the par value of such share; but no greater number of shares shall be issued or sold than shall be sufficient to raise an amount sufficient for the payment of the principal sums secured by the said bonds and the interest accrued thereon, and certificates of stock shall be issued to the purchasers of such additional shares upon payment of cash of the purchase price thereof, and the holders of the said shares of the increased capital stock hereby authorized shall possess and exercise the same rights and privileges in all respects as are possessed and exercised by the holders of the other shares of the capital stock of said corporation (other than the preferred stock thereof), and the proceeds of the sale of the shares representing such increase of capital stock shall be applied to the payment of such outstanding bonds as aforesaid and to no other purpose whatever.

And be it enacted, etc., That if the capital stock of any corporation shall be increased, as is authorized by the preceding section of this act, it shall be the duty of its president and secretary, within 30 days thereafter, to make a certificate under their respective oaths or affirmations, setting forth what bonds of such corporation have been paid by the proceeds of increased capital stock, and the number of shares of the increased capital stock thereof that have been issued for that purpose, and to cause such certificate to be filed and recorded in the office of the Secretary of State.

And be it enacted, etc., That this act shall take effect immediately.

The bill was introduced and passed without attracting special attention, but it is now said that its real object was to permit an additional issue of New Jersey Central stock. It has not yet been signed by the Governor.

THE SCRAP HEAP.

Amateur Railroad Regulation to Prevent Accidents.

A touch of naïveté shines out with humorous grotesqueness in the public discussion of the horrible disaster at Spuyten Duyvil. The Governor of New York, in a message to his Senate, declares that "Trains should be required by law to be supplied with all available appliances for breaking into a wrecked car and for the extinguishment of fire." Accordingly a bill has been introduced in the Senate which requires that every passenger, mail and express car shall have at each end one good fire extinguisher and a serviceable axe. Axes, indeed, would be likely to be useful, and the fact that they are never provided shows that railway superintendents do not give intelligent thought to means of relief in case of disaster. But the fire extinguisher plan is one of a thousand among devices for locking stable doors behind stolen horses. If a fire extinguisher were found in good working order after the upsetting of a train, and if anyone at hand were cool and skillful enough to apply it effectively it might, perhaps, extinguish a fire, but it would certainly extinguish the lives of any passengers who might be pinioned in a close space beside the fire, for men and women cannot, any more than flame, live on carbonic acid. The danger of such an appliance would, it is true, be diminished by the likelihood of its being found out of order, or forgotten, or ineffectively used at the crisis, unless, indeed, it worked automatically. This last thing would be only too likely to happen, irrespective of fire, whenever the end of a car, and with it the extinguisher, was crushed in among the passengers, who would, therefore, incur two dangers instead of one. This remedy is likely to turn out a mere obstacle in the way of better means for heating cars, by encouraging companies to retain their stoves, which, as they are commonly used, are so uncomfortable as well as dangerous that it is a wonder that people endure them. The cold air which is constantly entering the ordinary car drives the heated air into the upper part of the car, so that in cold weather the passengers sit with their heads in air heated to eighty degrees or so, while their legs are perhaps in air at thirty degrees. It is not easy to imagine a more uncomfortable or more unwholesome condition. The discomfort is done away with when the stove is used merely to heat hot-water pipes at the bottom of the car; but the danger remains, and is horrible enough to need a more masterful treatment than what we may call the soda-water remedy, proposed to the New York Legislature. We are reminded how, when some Western cities were horrified three or four years ago at the burning of the Southern Hotel, and other fatal fires in which many people were burned without a way to escape, instead of insisting that stairs should be provided that would not burn, and in sufficient number, state legislatures and city councils hastened to order rope and iron ladders, by which men, women and children, frightened out of their sleep, should climb down, outside, from the fifth and sixth stories of burning buildings. This is the ever-recurring folly of shirking the cost of a radical cure, and contenting one's self with a plausible palliation because it is cheap. It is so much less trouble to provide a fire-extinguisher than to devise a way of heating a car without a stove, that the public, unless it insists, will probably, in spite of warning, still be forced to travel by rail at the risk of being burned alive.—*American Architect, Feb.* 4.

Standard Rail Sections.

It seems that the diversity in the forms of rail sections is an evil which is felt in Europe quite as much as here. A late number of *Iron* says:

"A recent publication by the Inspector-General of Austrian State Railways describes the various sizes of steel rails and wooden sleepers employed on those railways, and indicates the limits within which the various dimensions ought to range, that the manufacture of rails has not only become more difficult, but also more expensive, on account of the numerous types than would be the case if more uniform sizes were used. Thus the height of the rails, certainly the most important feature, varies between 100 and 128 mm. ($3\frac{15}{16}$ and $5\frac{1}{16}$ in.); the height, however, most generally met with is 120 mm. ($4\frac{23}{32}$). The width of the head varies between 50 and 60 mm. (2 and $2\frac{3}{4}$ in.), the most common size being 57 mm. ($2\frac{1}{4}$ in.). The width of the foot ranges from 89 to 112 mm. ($3\frac{1}{2}$ to $4\frac{7}{16}$ in.); and in this particular the greatest diversity prevails, for nine railways have adopted 110 mm. ($4\frac{11}{32}$ in.) and ten lines 105 mm. ($4\frac{1}{8}$ in.); the others are without any agreement. The thickness of the web, a dimension of less importance in railmaking, shows a greater uniformity, of 12 mm. ($\frac{1}{2}$ in.), other dimensions being used only by sixteen railways, varying between 10 and 15.4 mm. ($\frac{3}{8}$ and $\frac{19}{32}$ in.). The proportion of the width of the foot to the height vacillates between 0.81 and 0.97, that of 0.92 and 0.84 only being more frequent. The radius of the lateral and upper contour of the head also varies greatly. The normal weight per metre of rail rises from 21.75 to 35.80 kilogrammes (47.85 to 78.76 lbs.), and is different for all railways. The length of rails ranges from 5.69 to 9 meters (18 ft. 8 in. to 29 ft. 6 in.), the length of 7 meters (23 ft.) alone recurring several times."

The Dining-Car System.

Among the attempts made during the past four years to add to the comfort and convenience of passengers on American railroads, none has gained such great popularity and such unqualified success as the establishment of dining-cars, whereby passengers care for the inner man while the train is in motion, and the annoyance of stopping for meals at certain stations is avoided. On these dining-cars first-class meals are served at the comparatively small cost of 75 cents per meal. On these cars meals are served that compare favorably with those served at the best hotels, and everybody has all the time he wants to partake of the good things set before him. The cost is no higher than is generally charged at the dining stations for the poorest kind of meals, and even these could not be relished because, before a person had satisfied his appetite, the call of "All aboard" reminded the hungry traveler that he must return to the train or be left behind. It is generally conceded that the railroads running dining-cars on their trains are much better patronized than those which have not adopted this popular improvement. Thus, one after another, the railroads establish dining-car lines and abolish the dining stations. The running of dining-cars is not a profitable arrangement, as far as direct receipts are concerned, and on most lines the expenses are greater than the income. Yet the indirect gain from the earnings of dining-cars is very great, as it advertises the roads and brings them increased business. To Chicago belongs the credit of having inaugurated this popular feature. The Michigan Central started the movement some five or six years ago, and the Chicago, Burlington & Quincy and the Chicago & Alton soon followed suit. The Rock Island was the next to fall into line. Then came the Northwestern, which also put on a line of dining-cars between Chicago and Council Bluffs, finding that it had to make the improvement if it meant to compete with the Burlington and the Rock Island on Council Bluffs business. Lately the Wabash has also added this new feature to its trains, and, in consequence, has greatly gained in popularity. The Eastern lines, with the exception of the Michigan Central, were rather disinclined to adopt the new feature, and not until a few months ago did they begin to comprehend that the mode of stopping for meals at stations had grown out of date Strange as it may seem, the conservative Baltimore & Ohio was the first one of the Eastern trunk lines to imitate the example of the Michigan Central in running dining-cars out of Chicago. The Baltimore & Ohio adopted this new feature a year ago, and its business has been greatly stimulated thereby.

When the Pennsylvania commenced to run its fast limited express between New York and Chicago, some months ago, it found that, to make schedule time, it could not stop for meals at stations, and it therefore became necessary for passengers to dine on the trains. Not having regular dining-cars at its disposal, it has used Pullman hotel cars for that purpose. The Pennsylvania, like all other roads which have adopted the new feature, finds that passengers prefer to dine on the train, and they have now come to the conclusion that it will greatly add to the popularity of their route by running regular dining-cars on all through trains between Chicago and Eastern points. Although late in the field, the Pennsylvania people mean to make their dining-car system second to none in the country. They have now in course of construction a number of magnificent dining-cars, which will be put into service as soon as finished.—*Chicago Tribune*, Feb. 14.

A Libel on Conductors.

A *Tribune* reporter met an old railroad conductor yesterday, and was surprised to hear that he had been discharged.

"Yes," he said, "the old man side-tracked me."

"What for?"

"Well, I suppose he thought I had too much money."

"Yours or his?" And he laughed.

"You remember I had begun working for the X. & Q. road in 1865, at the close of the war. From $50 a month I was gradually raised to $100. The other day the 'old man' (the Superintendent) found out that I owned and was paying taxes on $12,000 or $15,000 worth of property. So he kicked. He offered to keep me if I would 'restitute,' but I said I guessed I had railroaded about long enough."

"How did you save all that money in fifteen years from a salary of $600 increased gradually to $1,200 a year?" And he laughed again.

"As I'm out of the business now and kind of like railroad companies, I don't mind explaining the conundrum. I'll hold up my hand, though, and swear I always accounted for every passenger I ever carried. But I watered 'em—watered the company like as its directors water the stock. And I did it in this way: You see, every year the President and general officers issue an unlimited number of annual passes. Some of them are in exchange with other railroads, but most of them are to high-cock-a-lorums, Congressmen and members of the Legislature. I always made it my business when one of these fellows took my train to 'pipe him off'—that is, get in conversation with him, find out where he lived, and what his business was. You know, passengers always like civil treatment from a conductor; it seems odd like. With this acquaintance I used him."

"Used him?"

"Yes, used him. Knowing about how often his business required him to travel, I traveled for him. Do you catch on? When he didn't travel, I just deducted that much from my cash receipts and credited the annual bummer with one trip. My division cash fare was a little less than $7, and it was a poor run for me if I didn't turn in two or three old duffers."

"Ah, I see. You robbed Peter to pay Paul?"

"No, I robbed the annual passholder to pay myself. But my best bolt was in catching the passholder who wanted to rob the company. There's where I made the most of my money. You see, the average member of the Legislature not only thinks the company should carry him free, but all his friends. So he loans his pass to Tom, Dick and Harry, his neighbors. I made it my business to identify every legislative passholder. Every two or three weeks a man would get on my train and show up that pass. I would give him his check, go on through the train, do my work and then come back and sit down by him. I would say, 'Let me look at your pass again?' He would hand it out. I would then turn to my memorandum book and read: 'Archimedes Skrubendike, tall, dark hair, 30 years old: annual, O197.' Then I would turn to the rooster and say, 'Why, you're not Archimedes Skrubendike: you've no right to ride on this pass. Read the conditions on this—Not transferable.' And then the fellow would go all to pieces. He would beg, and plead, and offer fare, but I was too fly. When I had him bad enough scared, I would say: 'I'm sorry, and I hope this thing will never occur again. Now, I'll tell you what I'll do. I'll not take up this pass, as I am instructed to do, for Skrubendike is a good friend of the railroads, and I wouldn't have him get into trouble for anything in the world. You give me $10, and I will let you keep the pass to give back to him, only you must promise never to tell him you got caught.' And the fellow would snatch out $10 quicker'n wink. It's an honest fact, in one year I worked one old Skrubendike for more'n $300. The old duffer even loaned his pass to women."

"Anything else?"

"Well, if these two rackets don't account for what I've got it's no use buzzing to a blankety blank newspaper fool."—*Chicago Tribune.*

Heating Potato Cars.

A car has been in use for several months on the Maine Central road which is said to obviate many of the difficulties heretofore experienced in transporting potatoes in freezing weather. It was built at Waterville, Me., by the American Freight Car Heater Co., and is thus described: "It may be called a warm-air car. The requisite heat is obtained from four 8-in. kerosene burners, which are attached beneath the floor of the car and covered with iron plates. The burners are fed from an adjacent oil tank, which holds about 35 gallons, enough for 10 days' use. The car is so constructed that the heat from the burners is conveyed between the lining all around the freight, so that an even temperature of 35 deg. can be kept up as long as the oil holds out, at, it is said, a comparatively trifling expense."

A Queer Thing to Lose.

On Saturday night the corpse of an old man was shipped from Philadelphia to Elmira via the North Penn and Lehigh Valley railroads, and as it has not yet reached its destination, there is a good deal of anxiety to know what has become of it. The North Penn baggage-master says he saw the corpse in the car at Bethlehem when he got there, and that a lot of trackmen who had been out shoveling snow were sitting on the box eating their dinners. The car went on, though, and an effort is being made to trace up the missing body.—*Pottsville (Pa.) Miners' Journal, Feb.* 17.

Bound to Get on That Train.

Some excitement was caused at Seventh and Penn streets this morning by the attempts of two middle-aged women to board a moving passenger train. As the train which passes that point at 8 o'clock approached, the women requested the watchman stationed there to stop it, as they desired to get on board. The watchman refused to disobey orders by doing so, and the would-be passengers then signaled the engineer themselves. This failed to stop the train, and as it passed the women clutched the step rails and were dragged, and had the engineer not brought his train to a sudden stop they certainly would have been maimed or killed.—*Reading (Pa.) News, Feb.* 15.

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SOME OF THE WORK OF A RAILROAD COMMISSION.

During the present session of the Legislature of the state of New York there have been four different bills introduced for creating a railroad commission.

It is not the purpose of this article, though, to give a summary of the provisions of the proposed enactments, but to indicate somewhat more fully than was done in the article on the "Prevention of Railroad Accidents," published Jan. 27, the importance of imposing on such a commission the duty and delegating it with the authority of *investigating* railroad accidents, *reporting* all which occur and the causes which produced them, and *recommending* means for their prevention. Attention is directed to the words which have been italicised, because it is not proposed that the commission should have power to interfere with the administration of railroads, to which there are very great objections. These were very forcibly and concisely stated by the Secretary to the British Board of Trade, in his testimony before the Railway Accidents Commission in 1875, when he said:

"(*a*). General interference with the administration of railways is objectionable on the following grounds.

"(*b*). By such interference you are setting two people to do the work of one. Double management is notoriously inefficient.

"(*c*). You set those who have less experience of management and less personal interest in the result to control those who have more.

"(*d*). Control is either apt to become formal and a sham, or if zealously and honestly exercised, to be rigid, embarassing, and a hindrance to improvement."

The same gentleman, who at the time he gave his testimony, had been connected with the Board of Trade for 25 years, and therefore had abundant opportunity of judging of its working and its relations to railroad companies, said further:

"(*e*). The railway companies have no right to object to any interference requisite for securing the public safety. They have a monopoly of public traffic and are bound to do whatever is necessary for that object.

"(*f*). Nor is it necessary to argue that railway administration is perfect. It may be admitted that though their business is in general well and ably conducted, they are sometimes poor, sometimes niggardly, sometimes slow, and sometimes obstinate. Railway companies have also some of the defects of public departments in the size and cumbrous character of their official machinery, and in the remoteness of the bearing of the important motive of self-interest on the directors and managing officers."

With reference to the advantages of inspection and investigation the same authority said:

"(*g*). The reasons against government control which are above advocated are entirely consistent with a thorough system of government inspection and investigation. The function of throwing light on all parts of the railway system; of investigating all alleged dangers, whether accidents have happened or not, and of ascertaining the true cause of accidents which do happen, is one which the government can exercise with the utmost possible advantage, and without fear of dangerous results. It is one which is useful to the companies; for it points out to them real sources of danger, and relieves the public mind where there is unfounded apprehension of danger. It brings to bear on the companies the powerful motives of fear of public opinion, of parliamentary pressure, of apprehension of less traffic, and of legal liability for damages. And it does this without ulterior ill consequences. It is because these forms of remedy are in reality of very great efficacy, and because they are inconsistent with government control, that I deprecate the latter."

Under the existing condition of things, prevailing in this country, there is no government authority for investigating railroad accidents, excepting that possessed by coroners and the railroad companies themselves. Of the intelligence of the former and the impartiality of the latter it is not necessary to comment here. The point to which attention is called, though, and which is important in this connection, is that investigations of railroad accidents to have much value must be conducted by experts, persons familiar with railroad working, machinery and appliances, and with some knowledge of the methods employed in conducting investigations, examining witnesses, etc. A railroad commission should therefore be composed, in part at least, of one or more persons with the knowledge and experience indicated, or else they should have authority, as the British Board of Trade has, of appointing one or more "inspectors" competent to make such investigations. In fact, in devising a system for having such work done here we can hardly do better than to study the organization and the practice of the body referred to, which has now been in existence many years, and has been much criticised, although its work has generally been ably conducted. As the nature of its duties, authority and constitution are very little understood either by railroad managers or legislators in this country, this article will be devoted chiefly to setting forth the organization, authority and the methods of administration of the railway department of this board, which will perhaps indicate better than anything else could how a railroad commission here should be organized to make the investigations which the public interests demand.

The Regulation of Railways Act, 1871, among other provisions, says:

"The Board of Trade may direct inquiry into accidents and formal investigations in serious cases.

"It may appoint officers for the purpose of making any inquiry into the cause of any railway accident which it is authorized to make or direct, or for enabling it to carry the provisions of any general act relating to railways into execution. Such officers or inspectors may enter or inspect stations, works, buildings, stock, etc.; may summon any person who is employed in the service of the company, and require answers or returns to such inquiries, and may enforce production of books, papers, etc."

The act also provides that when "in the course of working any railway any accidents (1) attended with loss of life or personal injury to any person whomsoever; (2) any collision when one of the trains is a passenger train; (3) any passenger train, or any part of a passenger train, accidentally leaving the rails; (4) any accident of a kind not comprised in the foregoing descriptions, but which is of such a kind as to have caused, or to be likely to cause, loss of life or personal injury, and which may be specified in that behalf by any order to be made from time to time by the Board of Trade, take place" on the premises of the company, the latter "shall send notice of such accident and of the loss of life or personal injury (if any) occasioned thereby to the Board of Trade." Failure to comply with these provisions makes a company liable to a penalty not exceeding twenty pounds.

In accordance with this act the Board of Trade have issued orders to railway companies in which the accidents which must be reported are enumerated and forms for making the returns are provided.

Of the value of accurate reports and statistics of railroad accidents, it seems hardly necessary to speak here. That without them it is almost impossible to discern the real cause, or the extent of the influence of any one cause, every person who studies the subject carefully knows. At present there is good reason for believing that the reports which are made by railroad companies in this state are very far from being complete or correct. Many things which it is important to know they are not required to give, because the State Engineer either has not the authority to demand such information, or else has not seen the need of it. In an article published in these columns, Nov. 18 of last year, it was shown that the number of railroad employés injured, per locomotive, on the New York, Lake Erie & Western Railroad was, according to the State Engineer's report, nearly four times as great as on the New York Central, and in 1880 over three times as great. It may seem like a very unimportant matter to ascertain this fact, and yet one of two very important inferences may be deduced from it; either the former road is injuring more people than it ought, or the latter is not reporting those it does injure. In either case the state has a right to demand an explanation and carefully tabulated reports of the causes of injuries would soon show where to look for a remedy. There may be defects in railroad construction or operation which, like the evils resulting from bad drainage, will not be suspected until the effects are indicated by statistics of sickness and death.

In the article on the "Prevention of Railroad Accidents" some illustrations of the nature of the reports made by the Board of Trade inspectors were given. It should be said here that this board has no authority to enforce its recommendations excepting in the case of the construction of a new line—it can prevent it from being opened for traffic until it conforms to the requirements of the inspectors. In most cases, though, the recommendations are followed by the companies.

It is left to the discretion of the Board whether to make an inspection when an accident occurs or not, the interpretation of the word "serious" in the law being left to the Board. It may, however, make an inspection when there is no accident if there is reason to believe that a railroad is in a dangerous condition, or if a private credible person complains to the Board of the dangerous condition of any work. If the report is *prima facie* a credible and respectable one, an inspecting officer is immediately sent to see into it. Considerable difficulty has been encountered, though, in settling, as the Secretary of the Board testified, whether in such investigations "the object should be to throw light upon the transaction for your own guidance, or for the information of the public, or for the purpose of prosecuting persons who may have been criminal, or for the purpose of enabling persons who may have been injured by an accident to bring actions. * * * My notion is that the most important function of the Board of Trade is to throw light upon the facts, leaving all subsequent proceedings, whether civil or criminal, for a subsequent inquiry. * * * The evidence is made available to the public, and there is an elaborate report, all of which aid those who are injured in tracing the accident to the fault of the company, and therefore placing in the hands of such persons the means of bringing actions against the company. They are enabled to get up their case from that evidence."

The evidence is not taken under oath, and as it often happens that in such investigations the conduct of the companies' employés is impugned, the question has sometimes arisen whether their representatives should be present to assist. This has largely been left to the discretion of the inspector, as the companies sometimes objected. The Secretary, however, was of the opinion that when the companies are represented by counsel the inspector should have the assistance of a "barrister."

A number of railroad officers testified to the value of the Board of Trade reports to the railroad companies and their managers. It was said that they enable the directors to check the opinions of their own managers by the independent opinions of the officers of the Board of Trade.

There are defects and abuses in railroad construction and management existing in this country which would very soon disappear or be remedied if the light of intelligent investigation was thrown on them whenever they cause accidents. If there had been a succession of reports pointing out the weakness of drawgear, coupling-pins and links, whenever accidents from this cause occurred during the last few years, there would certainly have been a more general reform in this respect than has yet been effected. The diversity of signals and of rules for operating roads would soon disappear, and uniformity assume its place if the evil of it was pointed out by reports such as are made to the British Board of Trade. Some unanimity of sentiment would probably be created, too, in favor of constructing cars with interchangeable parts if the waste of money due to the present diversity was clearly indicated by some such authority, and instead of constructing cars with buffing arrangements made on two irreconcilable and dangerous systems, the managers of roads might have been led to take counsel together and to agree on some plans less dangerous to life and limb than the present ones are.

It was said by the Secretary of the Board of Trade that it has always been its doctrine that to make things public is its most useful function. If we have a Railroad Commission in this state let it exercise this function, and depend upon public sentiment and the courts to do the rest. There would be an advantage to all parties in an intelligent, judicial and independent authority, which should investigate and report upon complaints made against the railroads and whether railroad managers like it or not such an authority, to hear the complaint of the humblest citizen, to guard the rights and protect the lives and the limbs of the poorest employés as well as of the richest millionaire, will probably be established sooner or later. What the railroad companies, and the community also, need to guard against is a commission with extravagant powers, or one improperly composed, lacking the

judicial and expert element, and composed of ignorant politicians or "strikers," of which there is not a little danger.

THE PROSPECT FOR GRAIN TRAFFIC SINCE THE FALL IN PRICES.

The fall in prices of grain is regarded by many as likely to stimulate greatly the grain movement—at least shipments to the seaboard and exports. But we doubt very much whether any such effects follow, though exports may be increased for a time. The prices have been relatively higher at the Western markets than at the seaboard, and very high as compared with previous years, and the natural tendency of this has been to induce the farmers to market their grain as fast as possible, especially as the opinion was common, and pronounced by the Northwestern newspapers, which the farmers chiefly read, that prices were unduly high and likely to fall before harvest. If Northwestern receipts were not large in the last three months of last year, it was explainable by the fact that the crops were unusually light, and in the first six weeks of this year the receipts, in spite of the light crops, have been much larger than ever before at this season, as we have shown repeatedly. In this latter period the shipments eastward were also extraordinarily large, stimulated chiefly, no doubt, by the very low rail rates and the expectation that they would soon be advanced, while all the time Atlantic receipts and exports have been light.

It might be expected, under these circumstances, that there would be immense accumulations at the Northwestern markets; but, in fact, we find that the "visible supply of grain" Feb. 11, including the stocks in store at Western and Eastern markets and that in transit between them, was as follows in the last three years:

	1882.	1881.	1880.
Wheat	18,134,223	27,167,389	28,889,896
Corn	17,887,770	16,097,676	14,817,756
Oats	2,933,208	3,534,647	3,018,733
Barley	2,671,880	3,197,564	3,897,025
Rye	1,167,792	692,485	902,674
Total	42,794,873	50,689,761	51,526,084

We see thus that the accumulations now are about 8,000,000 bushels *less* than last year and 8,700,000 less than in 1880, and of wheat, the chief export, there are now 9,000,000 bushels less than last year and 10,750,000 less than in 1880.

So far as the railroads are concerned it is most important to know whether the stocks are in the West, and still to come forward, or in the East, where they will not have them to carry. Now at the five Eastern Atlantic ports, New York, Boston, Montreal, Philadelphia and Baltimore, the accumulations of wheat and corn were, Feb. 11:

	1882.	1881.	Increase.	P. c.
Wheat	7,467,187	6,887,002	580,185	8.4
Corn	5,809,099	2,311,341	3,497,758	151.3
Total	13,476,286	9,198,343	4,077,943	44.3

Thus the accumulations at the other places (and the "other places" are all Western, except Toronto, Buffalo, Oswego and Albany, having this year less than 1,250,000 bushels of wheat and corn), are as follows:

	1882.	1881.	Decrease.	P. c.
Bushels	22,545,707	34,066,722	11,521,015	33.8

A comparison with the reports made in previous years of the stocks on hand at the only nine Western markets at which there is any considerable storage room—namely, Chicago, St. Louis, Milwaukee, Toledo, Detroit, Duluth, Indianapolis, Peoria and Kansas City—gives the following as the stocks of wheat and corn (the only grains largely exported):

	1882.	1881.	1880.
Wheat and corn	18,553,717	26,233,988	29,297,202

Thus the Western stocks of these the grains which are chiefly shipped (the rye, oats and barley being largely consumed in the West) are this year 7,680,000 bushels (29 per cent.) less than last year, and 10,744,000 bushels (36⅞ per cent.) less than in 1880. Compared with last year there is a decrease at every place except Peoria, where very little is ever stored, and it is rather larger at the lake cities than elsewhere, and at Chicago, where the speculation has been greatest, and to which, consequently, an unusual quantity of grain should have been sent, there is 3,100,000 bushels (24 per cent.) less than last year, and at Milwaukee nearly 50 per cent. less.

But not only did the circumstances this year tend to lead the farmers to market their grain—very high prices, good weather, and most of the time good roads; but last year the circumstances hindered the marketing of grain after the close of navigation; great snow-storms blockaded the roads and the railroads, and prices were much lower than they have been this year. Yet still we see this very large decrease of 29 per cent. in the accumulations at the Western markets.

It is thus not possible that there should be large shipments of grain from the West to the Atlantic seaboard hereafter, as compared with 1881 and 1880, unless there is an unusually large amount in the farmers' hands. As we have said, the extraordinarily high prices that have prevailed would make this altogether improbable, even if we knew nothing of the production of last year. But in face of the fact that the statistics of the Department of Agriculture show the crop of wheat to have been 118,000,000 bushels less and of corn 550,000,000 bushels less in 1881 than in 1880, it is not easy to understand why any one should expect a heavy grain movement this year. Of corn especially the country has little to spare, and it is sparing but little. From Sept. 1 to Feb. 11 our exports have been but 17,850,000 bushels this year, against 35,022,000 last, and the large accumulations at Atlantic ports will doubtless be sold chiefly for domestic consumption.

The railroads, at least those between the West and the seaboard, have probably had in the first seven weeks of this year a heavier grain traffic than they will have again until after harvest, and all the railroads a much heavier one than they will have again before the opening of navigation. The tremendous stimulus given to shipments from the West by the knowledge that rates would soon be advanced from 10 to 20 cents per 100 lbs.—the former being less than the water rates are likely to be when navigation is open—seems to have led some to suppose that there is an immense grain traffic to be carried. Further, many doubtless have been deceived by the fact that seaboard receipts were very light even during the month and a half that Northwestern receipts and shipments were extraordinarily large. They seem to have noticed the receipts at these markets, but not the shipments, or to have concluded that because the Atlantic receipts have been unusually small the Northwestern shipments could not have been unusually large. But we have shown before that they have been, and that an extraordinarily large proportion of these shipments must have been for interior domestic consumption, which also was to be expected.

It must be remembered that a reduction of the production of the states east of Ohio which never export grain compels these states to increase their purchases in the West. The estimates show the production of corn alone east of Ohio to have been about 22,000,000 bushels less in 1881 than in 1880, and all of this has to be made up by importations from the West, regardless of exports. The South, too, has required immensely greater supplies from the West than the year before, the failure of the corn crop being worst there. Thus there is good reason that even when receipts and shipments at the Northwestern markets are large, the receipts at Atlantic ports and the exports should be small.

In one respect, however, the present condition of things is favorable to the railroads. An unusually large proportion of the crops will be consumed in the interior, and by far the larger part of this must be carried by the railroads, even after navigation opens, and on this they can obtain higher rates than are possible on export grain. It is doubtful if the roads take advantage of this, however; they will probably, as usual, make rates low enough to enable them to share whatever export trade there may be, and have these rates apply to all the grain forwarded to points east of Buffalo and Pittsburgh. That is, they will permit the rates required for the small amount (this year) exported to rule, and so prevent the obtaining of reasonably profitable rates that might be had in the larger traffic carried for domestic consumption.

Foreign Railroad Notes.

The new Berlin elevated "City Railroad," crosses the city from east to west, uniting the railroads on the east with those on the west of the city, and having two tracks for through and two for local trains. There are nine stations on the line, but only four or five of them are on the through tracks. The railroads from Berlin westward will start from the eastern end of the city railroad, and stop at two other stations within the city, as well as at the western terminal station of that road, which is in a suburb (Charlottenburg), and the trains to the east will start at Charlottenburg, and make similar stops. This is somewhat as if passengers by the New York & New Haven, the New York Central, the Pennsylvania, the Erie and the other Jersey City lines could take the train either at the Battery, at Fourteenth street, at Twenty-third street, at Forty-second street or at Harlem. There are no first-class cars run on the local City Railroad trains. The second and third-class fares are:

Silesian station to—	Distance.	Second-class.	Third class.
Jannowitz Bridge	0.73 mile	4.86 cents	2.43 cents
Alexander place	1.35 miles	4.86 "	2.43 "
Stock Exchange	1.78 "	7.29 "	4.86 "
Frederick street	2.47 "	7.29 "	4.86 "
Lehrter station	3.36 "	9.72 "	7.29 "
Bellevue	4.35 "	9.72 "	7.29 "
Zoological Garden	5.60 "	9.72 "	7.29 "
Charlottenburg	7.00 "	12.15 "	9.72 "

The *Journal* of the German Railroad Union commenting on these rates says they are the cheapest possible and, so far as it knows, more favorable to the public than on any other road. They are not cheap, however, compared with the rates on the New York elevated roads, though, owing to there being but one class here and but one rate, whatever the distance, and this rate varying at different hours, we cannot compare them directly. The passenger in New York is carried in a first-class car a distance from half a mile to eleven miles for ten cents, except between the hours of 5 and 8 in the morning and 4½ and 7½ in the evening, when the charge is but 5 cents. Rather more than half the entire travel is in the 5-cent hours. The average rate per passenger received is about 7 cents, which is a little less than the Berlin roads' second-class fare for 1¾ miles and its third-class fare for 3⅝ miles. Trains on the Berlin road are to run every 10 minutes. It will be worked in connection with the Belt Railroad around the city, which has been in operation many years. A train will run around the northern semi-circle every hour and one around the southern semi-circle every two hours, thus bringing the immediate suburbs into close connection with six or seven points in the centre of the city, though with what would be regarded infrequent trains on our suburban lines.

It was the aim of the Prussian authorities to make this road as nearly perfect as possible, and it is said to be a magnificent piece of construction, and magnificently equipped.

There are four ticket windows at each station. At the head of the stairs leading to the platform a ticket inspector is stationed, who admits only those provided with tickets and punches the tickets. Again on the cars a ticket inspector sees that there are no third-class passengers in second-class cars (there not being time to inspect the tickets as the cars are entered) and that passengers do not ride further than their tickets read. Finally, at the station where the passengers get off another ticket inspector takes up the tickets and sees that they are for his station. If the passenger has no ticket he is fined. This will probably require at least four times as many men as are connected with the ticket service on the New York roads, who are needed largely because there are different rates for different distances.

The cars have side entrances, which the passengers open and close themselves. In this way it is expected that a stop need not be for more than half a minute, even when many get on and off. Each car having five or six doors, instead of two, it can be loaded and unloaded much quicker than an American car. The trains are equipped with a vacuum brake, as are the trains on the New York elevated roads and the longer of the two London underground roads.

The running time of trains we do not find stated, but their maximum speed is limited to 28 miles an hour.

The minimum radius of curves on the road is 919 ft., and the maximum grade 42¼ ft. per mile. There is 43 per cent. of the road in curves and 20 per cent. has grades. The western end of the road, which is in the suburbs, alone is built on earthwork. The rest of it is on massive masonry arched viaducts, the streets being spanned by iron bridges. It will be understood, then, that it is not in the streets, but across the blocks. The stations are entered from the street level, and there are the ticket office and waiting-rooms, there being only the platform above on a level with the track.

It is said that Earl Delawarr, who was a member of the Parliamentary Commission which reported a few years ago on railroad accidents, and for which the elaborate experiments with continuous brakes were made near London, will at the session of Parliament lately opened introduce a bill to make the use of continuous brakes compulsory on British railroads after January, 1885. The qualities demanded are, "in connection with each passenger train a continuous brake, which shall be efficient in stopping the train, instaneous in action, and applicable without difficulty. It must also be immediately self-acting in case of accident, capable of being easily removed, and be of durable material. The brake in each vehicle of a train is to be susceptible of being worked as part of one system."

When the Accident Commission reported, it strongly recommended the adoption by the railroads of some brake having these qualities, but did not propose to make its use compulsory. Then, or perhaps a little earlier, the Board of Trade inspectors recommended the general adoption of such a brake, and included among the requirements automatic action and some other peculiarities which were quite commonly assumed to define the Westinghouse automatic brake without naming it. It was then suggested that the railroad companies should be given a few years, at the end of which it was hoped that they would have completed their experiments, made their selections, and at least begun the equipment of their rolling stock. But the report was followed by trials on a small scale of many different kinds of brakes, and in reply to the questioning of Board of Trade inspectors, etc., the companies have quite commonly said that they had not yet determined which brake was best, and charges have been made that they have continued their experiments with various different brakes, not because they had any reasonable expectation of finding anything better, but to put off the time when they would have to pay for the equipment of the rolling stock, which is a somewhat serious matter to a line with some thousands of passenger cars, of which there are several in England. It is generally dangerous to introduce mechanical improvements by law, and it has very rarely been done, even in Continental countries; but the theory of the British railroad policy is to watch the roads, investigate, suggest, complain, and, if companies persist in neglecting precautions that have been fully proven to be practicable and effective, then to legislate or to threaten legislation; the threat, where there is little difference of opinion as to the desirability of the course recommended, is usually suf-

ficient, and is so in questions of rates, accommodations, etc., even more than in safety appliances.

The Austrian Ministry of Commerce last spring sent a commission to Italy to study the steam tramways which have attained a wonderful development there, not approached elsewhere in the world, and have proved so efficient in the local traffic as to make it worth inquiring whether they might not be made to answer similar purposes in other countries where the traffic is not sufficient to support an ordinary railroad.

The roads are built usually on the public highways, and often through the very heart of towns and cities, and in very narrow streets, and are said to carry a very active traffic with great promptness and apparently no appreciable disturbance of the street traffic; at least these roads are almost universally welcomed by the people who live on the streets and highways through which they run. The roads usually have but few stations, but many stopping places. But few cars are run in a train, but often there are frequent trains. Generally there are as many as eight trains of four cars each in each direction; and there are routes where two omnibuses carried all the traffic which now give business for 12 trains daily.

The first steam tramway was opened in 1877, but at the end of April, 1881, there were 562 miles in operation and 95 under construction, while 749 miles more were projected. The province of Milan alone has 190 miles of such roads. Special permission has to be obtained for the construction of such a road, but otherwise, with regard to construction operation and rates, they are not subject to the government regulations which apply to ordinary railroads in Italy.

These roads seem to be supported almost exclusively by passenger traffic, and would be possible (conducted in that way) only where there is a dense population.

The Prussian government has submitted to the Parliament its reasons for asking for authority to purchase a considerable additional number of railroads, and in justification of its policy it not only argues the advantage of a state railroad system in itself, as it did before the first great purchases were made, in a long and masterly document which we published two years ago, but it charges that the declared policy of the state to absorb the private railroads makes the latter particularly inefficient and remiss in their duties to the public. It was not expected to buy all the roads at once, and, so far as the state is concerned, it might desire to postpone the purchase of some for several years, but the companies knowing that their roads are to be bought some day and that the price paid will depend largely upon their profitableness at the time of purchase, bend every energy towards securing immediate profits, with scarcely any view to future years. They neglect expenditures for increasing rolling-stock, new tracks and stations, and especially new branches, the returns from which, though perhaps ample in the long run, are small at first; but they eagerly undertake what will lessen the profits of the state roads, hoping to force the government to purchase their lines on more favorable terms than could otherwise be secured. And they use all kinds of means to secure that traffic for which the state lines compete with them. Further, the government feels more than ever the need of having all the roads worked as one uniform system. It reports that the state system has fully justified itself, but makes few definite statements of the advantages gained. There was great dissatisfaction last year owing to a traffic blockade, but the government report says that this could not have been provided for beforehand, and that it would have been worse if the railroads had not been worked by the state.

The Prussian government reports that in its last fiscal year it made a profit of more than $7,000,000 on the railroads which it has recently acquired—that is, so much more than was required to pay the interest on their cost, or the rental or other charge which it pays for them. The government now promises to buy more roads, to build some, largely increase its rolling stock, and to begin some important canal and river improvement works.

During the discussion in the Prussian House of Representatives on this state railroad report, Richter, the former Minister of Commerce, an opponent of the state railroad system, pointed out that the favorable surplus of 29,000,000 marks ($7,025,000) reported for the last year included receipts for 15 months, but interest for only a year. He also complained that very large sums were asked for increasing equipment, adding to tracks and reconstructing stations, though when the question of buying the roads was before the Parliament it was claimed that by uniting the roads into one system they could be worked with less rolling stock and be generally more effective than when in several private hands. Again the government estimated a surplus of 13,000,000 marks for the next railroad year. Richter said that 6,000,000 of that was due to the exchange of stocks of roads which the government had bought for government bonds. The interest on the latter does not go into the railroad accounts at all, but before the exchange the dividends were charged against the roads which paid them, and the 6,000,000 are simply taken out of a different pocket. The Minister of Public Works acknowledged that there were receipts for 15 months and interest for only 12 months in the report, but said that allowing for this there was a surplus of 21,000,000 marks for the last year.

A somewhat noted light railroad in Germany is the Felda road, in Saxe Weimar Eisenach, a narrow-gauge line 27½ miles long, three-fifths of which is laid in the public highways. It was built and is worked under a long lease by a firm of locomotive builders who make a specialty of light locomotives, and who have just published a book about the road. When the road was built, on the shortest curves (of 190 ft. radius), the superelevation of the outer rail was made as much as 4 in., and the gauge at the same places was widened 1¼ in. But as there were several derailments at these places, the elevation was reduced so as not to exceed ¾ in. anywhere, with a widening of the gauge of from ⅝ to ¾ in., since which there have been no more derailments. The engines which this firm builds are usually made purposely so as not to run faster than seven miles an hour, at which speed the centrifugal force on a curve of 190 ft. radius can hardly be formidable.

The present President of the Counsel of the Swiss confederation, Simon Bavier, is an engineer, educated as such in the German technical schools at Stuttgart and Karlsruhe, employed in the service of the Swiss government and in railroad construction in Italy, and widely known among European engineers by a book he has written on "The Roads of Switzerland." In the recently formed French cabinet no less than three members are engineers. Freycinet, the Prime Minister, Varroy, the Minister of Public Works, and Tirard, the Minister of Commerce. French engineers have a wider and more general education than is common in other countries, where the training is apt to be exclusively technical, and an engineer is nothing but an engineer.

At a recent meeting of the Austrian Railroad Club Dr. Emil Lange read a paper on the Austrian legislation respecting railroad tariffs. Dr. Lange divided the Austrian railroads, with respect to rates, into three groups, the first including the roads (including some of the most important) which can change their rates according to necessity and the circumstances, the government, however, having the right to oppose extortionate demands. The second group includes those roads that must obtain government approval for their rates. In the third group the maximum rates permissible are definitely fixed in their charters. There are, however, some roads whose charters fix *minimum* rates for them, below which they must not go.

Good progress has been made on the Baku & Tiflis road that, in connection with the Poti & Tiflis (built some years ago) will unite the Black with the Caspian Sea, passing parallel with and south of the Caucasus. The new road is built from the Caspian end westward, and 138 miles of track are laid on it. The eastern end of it passes through the Russian oil region. The road from the Black to the Caspian will be about 500 miles long, and passes through one of the old homes of the human race, Mount Ararat being almost within sight, while the new part is mostly in the valley of the river of Cyrus.

A German writer complains that too little attention is given to making the leaving times of trains at great cities such as can be easily remembered. He says they ought to be at the even hours or quarter hours, when in fact they are as likely to be at 8:57 as at 9 o'clock, at 2:17 as at 2:15. Dinner hours, times of opening court, theatres, etc., he says, are put at even hours, or times that it is possible to remember, and so it should be with train times. And so it is almost universally in this country. If there is a train at 9:03 here, it is usually because there was another train at 9.

One of the Austrian railroads has introduced an exceptionally low rate for exports of various articles, such as iron, coal, salt, potters' clay, etc., namely, 1.64 cents per ton per mile, which is just about twice the average rate in the state of New York in 1878–79.

Austria and Hungary have a case of differences of rates to seaboard ports to settle. The ports are Trieste and Fiume, near the head of the Adriatic, Fiume being an upstart rival of the older Trieste—a sort of Baltimore to Trieste's New York. The difference in distance is inconsiderable, and one road contracted with Austria to make the rates alike to both, a contract which Hungary opposes.

The Wiener-Neustadt Works, near Vienna, Austria, during the fiscal year 1880–81 received orders for 215 locomotives, most of them from foreign countries. Since the middle of November, 1880, the number of men employed in these works has risen from 460 to 1,920.

In Germany there are 23 car-works, which together can turn out from 21,000 to 25,000 4-wheel freight cars yearly, if wholly engaged in such work. Most of the works, however, also construct passenger cars, street cars, turn-tables, etc.

The proposed International Railroad Exhibition at Berlin has been abandoned. The reason given is that the old railroad station and yard designed for the Exhibition must be devoted to other purposes, and that there is no other fit place in the city that can be had.

The Austrian government now works 200 miles of railroad which it owns, and 1,194 miles belonging to companies, while 407½ miles that it owns are worked under contract by corporations.

In 1881, 187 miles of new railroad were opened for traffic in Austria and 79½ in Hungary, in twenty different lines, the longest being 33½ miles long.

The railroads of Austria and Hungary in 1881 earned $107,925,000, which is 4.6 per cent. more than in 1880. Their earnings per mile were $9,380 in 1880.

January Accidents.

Our record of train accidents in January, given on another page, shows a total of 137 accidents, in which 41 persons were killed and 198 injured. Twenty-three accidents caused the death of one or more persons; 33 caused injury, but not death, and in 81, or 59.1 per cent. of the whole number, no serious injury is recorded.

Of the 41 persons killed 25 were railroad employés and 16 passengers, and of the 198 injured 67 were employés and 131 passengers. Thus 61.0 per cent. of the killed and 33.8 per cent. of the injured were employés, and the month is a somewhat exceptional one, because a large number of injuries to passengers are reported from a single accident.

As compared with January, 1881, there was a decrease of 84 accidents, but an increase of 11 in the number killed and of 16 in that injured.

These accidents may be classed as to their nature and causes as follows:

COLLISIONS:		
Rear collisions	45	
Butting collisions	15	
Crossing collisions	4	
		— 64
DERAILMENTS:		
Broken rail	7	
Defective rail-joint	1	
Broken bridge	2	
Spreading of rails	4	
Broken wheel	4	
Broken axle	3	
Land slide	1	
Wash-out	1	
Snow	2	
Accidental obstruction	4	
Misplaced switch	10	
Rail purposely removed	2	
Unexplained	28	
		— 69
Boiler explosions		2
Broken connecting rod		1
Car burned while running		1
Total		137

Five collisions were caused by misplaced switches; four by mistakes in giving orders or failure to obey them; three by trains breaking in two; three by failure to use signals; two by fog, and one each by carelessness in putting a train on a siding and by the wreck of a train on another track.

Of the two broken bridges, both were iron and one comparatively new. Besides these two there were two bridges which failed under the shock of a collision or derailment upon them, but in these cases the failure of the bridge was not the direct cause of the accident.

A general classification of these accidents may be made as follows:

	Collisions.	Derailments.	Other.	Total.
Defects of road	..	14	..	14
Defects of equipment	3	7	3	13
Negligence in operating	58	10	..	68
Unforeseen obstructions	3	8	1	12
Maliciously caused	..	2	..	2
Unexplained	..	28	..	28
Total	64	69	4	137

This classification is as close as it is possible to make with the information obtainable. Greater care in management would very probably prevent some of the accidents charged to defects of road or equipment; but how many of them it would be impossible to say without a close investigation in each case. Some of the unexplained derailments were, in all probability, due to defects of road; a few, perhaps, to defects of equipment; more of them, again, to faulty construction.

It is by no means encouraging that no less than 15 accidents—10 derailments and five collisions—were due to carelessly misplaced switches. The fact is anything but creditable to managers.

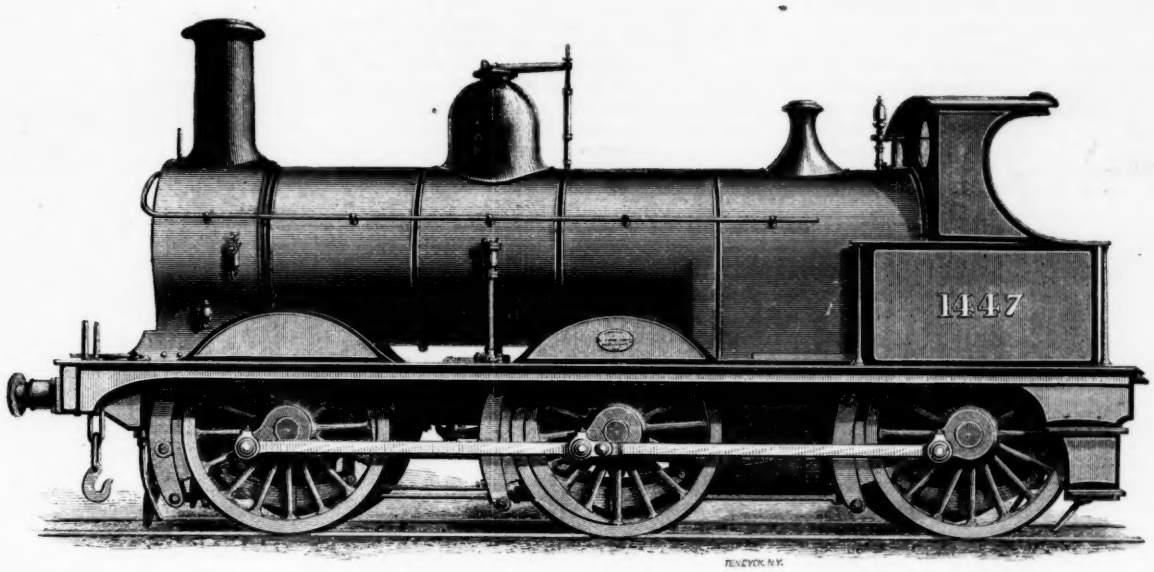
Both the malicious derailments were caused by the removal of a rail from the track. Train-wreckers are learning that this is a surer way than the old clumsy fashion of piling up wood or stones on the track.

A division according to classes of trains and accidents is as follows:

Accidents:	Collisions.	Derailments.	Other.	Total.
To passenger trains	4	21	2	27
To a pass. and a freight	11	....	...	11
To freight trains	49	48	2	99
Total	64	69	4	137
Casualties:				
Killed by	25	14	2	41
Injured by	55	139	4	198
Total	80	153	6	239

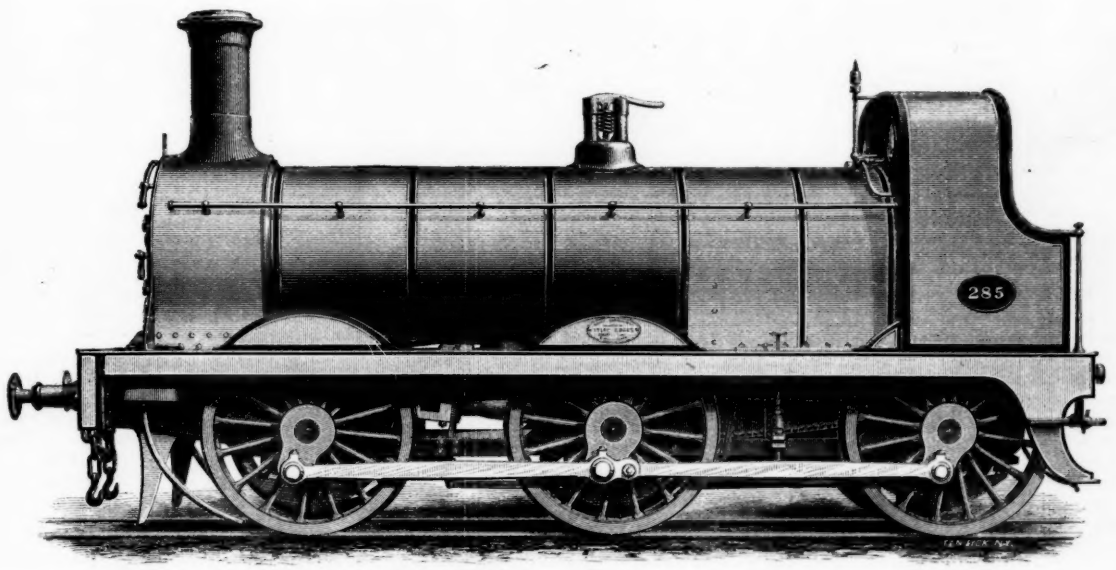
The weather of the month presented a sharp contrast to that in January of last year, when intense cold and a constant succession of snow-storms made the operation of roads almost impossible in some parts of the country, and life a burden to railroad men. This year the weather was remarkably mild, with only a few days of really low temperature and one or two snow-storms, which were not of great severity. As might be expected, we find comparatively few of the accidents peculiar to winter. But two derailments caused directly by snow are reported, and there are not many breakages of iron, except quite a number of broken rails. The accidents which especially mark the month, as for some months past, are accidents of management. Rear collisions continue to be numerous without special cause, and butting collisions are more in number than they should be. The month once more teaches the often repeated lesson of the necessity of stricter discipline, the enforcement of personal responsibility of employés, more thorough instruction in their duties and the more certain enforcement of penalties for negligence.

The notable accidents of the month were two in number. The first in point of time was the failure of the Wells Bridge on the Boston & Maine, which was marked by a large number of injuries. Fortunately most of these were but slight, but there was a very narrow escape from a frightful loss of



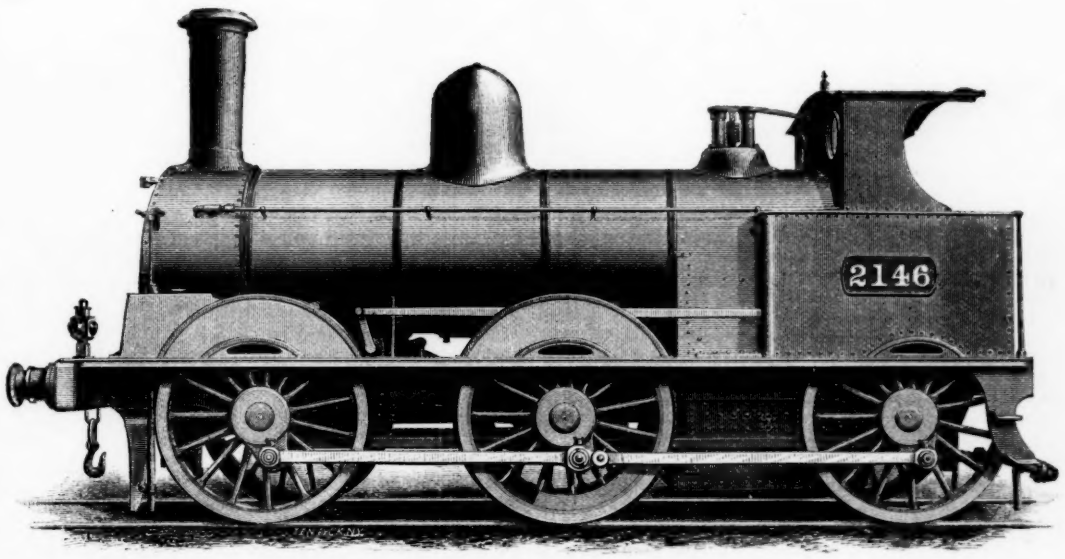
"GOODS" LOCOMOTIVE, MIDLAND RAILWAY.

Samuel W. Johnson, Locomotive Superintendent.



"GOODS" LOCOMOTIVE, SOUTHEASTERN RAILWAY.

By Sharp, Stewart & Co., Manchester.



"GOODS" LOCOMOTIVE, LONDON & NORTHWESTERN RAILWAY.

F. W. Webb, Locomotive Engineer.

life by fire. A long investigation in this case resulted in a somewhat vague and unsatisfactory verdict.

The other was the terrible tragedy at Spuyten Duyvil, of which so much has already been said in our columns that it is unnecessary to make further comment here. This accident has its lessons, from which some profit has already come, and more may come hereafter.

For the year ending with January the record is as follows:

	Accidents.	Killed.	Injured.
February	149	27	253
March	113	38	177
April	63	22	66
May	85	24	76
June	73	31	78
July	102	38	122
August	129	31	67
September	144	56	227
October	131	31	133
November	133	50	120
December	113	36	96
January	137	41	198
Totals	1,372	425	1,613
Total, same months, 1880-81	1,239	354	1,304
" " " 1879-80	859	173	669

The averages per day for the month were 4.42 accidents, 1.32 killed and 6.39 injured; for the year they were 3.73 accidents, 1.13 killed and 4.42 injured.

The average casualties per accident were, for the month, 0.299 killed and 1.445 injured; for the year, 0.309 killed and 1.176 injured.

The averages per month for the year were 114 accidents, 36 killed and 134 injured, against similar averages of 103 accidents, 28 killed and 109 injured in 1880-81, 72 accidents, 14 killed and 56 injured in 1879-80.

The record for the year does not begin well, and it is to be hoped that the later months will show an improvement.

From the Rio Grande to the City of Mexico.

A description of the line of the proposed Gould Mexican line, from Laredo to the City of Mexico, the "Mexican Oriental, International & Interoceanic," makes it extend nearly due south, from the crossing of the Rio Grande at Laredo through the states of Tamaulipas, Hidalgo and Mexico, also cutting off a corner of Nuevo Leon and San Luis Potosi. Glowing descriptions are given of the country on the line, which for three-fourths of the way is in the foot hills some 50 or 60 miles from the Gulf, and thence over the mountains.

The best Mexican authority gives the following as area and population of the states on the line, Tamaulipas being a long, narrow state, extending from Laredo along the Rio Grande and the Gulf to Tampico, more than 300 miles, and within 200 miles of the city of Vera Cruz:

	Square miles.	Population.
Tamaulipas	30,224	140,000
Hidalgo	8,160	404,207
Mexico	7,844	663,557
Total	46,228	1,207,764
Nuevo Leon	23,630	178,872
San Luis Potosi	27,500	460,322
Total five states	97,358	1,846,958

Only a very small part of the two last-named states is reached by this line, but it will be the only railroad in Tamaulipas, except the International line, already completed across the very narrow neck at the north end of it, and perhaps another east-and-west line across its extreme southern border to Tampico. In the state of Mexico it will be one of five lines, the others being already constructed; but, like the other four, it will share the traffic of the "Federal District," in which the city of Mexico is situated, and which is almost surrounded by the state of Mexico. This district is credited with 315,996 inhabitants.

The whole line will be about 600 miles long, extending to the east of north from the city of Mexico for 100 miles or more, and thence nearly due north. The largest towns on or near the route are: Victoria (about 225 miles south of Laredo), 6,000 inhabitants; Pachuco, 12,000, and the city of Mexico, with about 250,000.

The Mexican National line from Laredo extends first southwest from Laredo by way of Monterey and reaches the table lands by an easier line, and goes south on the plateau, instead of the foot hills, and is most of the way something like 80 or 100 miles further west. The chief states on its line between Mexico and the Rio Grande (it has other lines reaching other states) are:

	Square miles.	Population.
Nuevo Leon	23,630	178,872
San Luis Potosi	27,500	460,322
Guanajuato	11,409	900,000
Mexico	7,844	663,557
Total	70,383	2,202,751

This road will probably run a few miles across a corner of Coahuila, and for a little longer distance on the borders of Michoacan, through which latter state its line to the Pacific extends, but these cannot properly be counted as belonging to the Laredo line. The Mexican Central is not far from the southern portion of this line.

On the two lines between Mexico and Laredo, leaving out Mexico, which is common to both, and crediting Nuevo Leon and San Luis Potosi wholly to the National, and Tamaulipas (a little corner of which the National crosses) wholly to the Oriental, we find a population of 24.6 per square mile on the National and of 14.2 on the Oriental. The state of Tamaulipas, on the latter, has a long sea coast, but it avails it but little for transportation, as there are practically no harbors, and no seacoast towns worth mentioning. The railroad will hardly feel the competition of the sea.

The largest towns on the National are Monterey, 13,500 inhabitants; San Luis Potosi, 34,000; Guanajuato, 63,000, and the city of Mexico. In the state of Guanajuato the city of Leon is credited with 100,000 inhabitants, but this is on a branch at some distance from the Laredo line.

The thickly peopled part of Mexico is in a comparatively small area in the centre of the country, including 14 of the 27 states and 190,000 out of the 740,000 square miles of the area of the whole country. These 190,000 square miles have about 7,460,000 inhabitants; south of these central states there are six states with 200,000 square miles and 825,000 inhabitants; north of this central group there are seven larger states, with 350,000 square miles (nearly half of Mexico) and 1,060,000 inhabitants. Thus in the central states there is an average population of 39¼ per square mile—nearly the same as in Virginia by the last census; in the southern states the population is 4⅛ per square mile; in the great northern states, bordering chiefly on the United States, it is 3 per square mile—something like that of Colorado.

The central states, or the territories in which population is most dense, extend for perhaps 250 miles north of the city of Mexico, but only about 70 miles south of it.

Further, the densest population is not in the coast states, as in this country, but in the interior. Thus Vera Cruz, which stretches along the Gulf coast some 400 miles and usually only about 50 miles inland, has a population of but 19¼ per square mile, though it has the chief port of the country, while Pueblo, next west, has 58 per square mile, and Mexico (excluding the city and its suburbs, which are in the "Federal District") has 85; Michoacan, a large state extending from Mexico west to the Pacific Coast, has 26 inhabitants per square mile, and Guanajuato, which is north of it and northwest of Mexico, has 79.

It is evident that the railroads north of this central territory, where the average population is but three per square mile, will generally depend for traffic on a development of the country. In the way of mines, decided progress has been made in this direction within two or three years. The central states, however, have population enough to support many railroads—at least, the same population in the United States would give a profitable traffic to much more railroad than has been projected even in Mexico. With as many inhabitants per mile of road as Virginia has (which has the same density of population), these 14 central states would have 9,000 miles of road. It will be a great mistake, however, to assume that there will be anything like as much transportation in proportion to population in Mexico as in the United States. Between these central states and the United States lies an immense territory (about 600 miles from north to south and extending from the Rio Grande to the Pacific), where on the average the population for 50 miles on each side of a railroad would be but 300 per mile, against the 825 per mile in the state of Virginia. This does not make it impossible for a few lines in certain places to secure support, but it does prove that there is a very limited field for the construction of railroads there, unless there is a great growth in its population and industries; and an excessively large number of roads have been projected there, probably because this territory is nearest to the United States.

The Houston & Texas Central.

The Houston & Texas Central Railway, whose lines are in the best and most thickly peopled part of Texas, has reported its gross and net earnings and expenses for successive years as follows:

Year to Apr. 30.	Miles.	Gross earnings.	Expenses.	Net earnings.
1873	505	$3,286,818	$1,972,091	$1,314,727
1876	505	3,156,306	1,838,176	1,318,130
1877		No report		
1878	505	2,668,017	1,737,975	930,042
1879	516	3,031,632	1,720,559	1,611,073
1880	522	3,409,743	1,853,148	1,556,595
Year to Dec. 31.				
1879		3,205,684	1,773,771	1,431,913
1880		3,741,000	2,007,323	1,733,677
1881		3,748,655	2,141,872	1,606,783

The brief statements made in lieu of annual reports do not say whether the returns cover the leased Texas Central, but it is probable that they do. That road was 100 miles long at the beginning, and 177 miles long at the end of 1881. There are 510 miles of road owned by the company, and it probably substantially owns the Texas Central.

The statement for 1881 shows scarcely any change in gross earnings, which was to be expected, in view of the great drought and failure of corn and cotton in Texas last summer, but an increase of 7 per cent. in expenses and a consequent *decrease* of $126,894, or 7⅛ per cent., in net earnings. The latter, however, were $448,817 in excess of the interest on the bonds, which is equivalent to 5.8 per cent. on the stock of the company. This surplus, together with $614,297 realized from the sale of general mortgage bonds, was applied to improvements of the road, for which, according to all accounts, there was plenty of room.

If the earnings reported were from the whole system, they were at the rate of about $5,770 per mile last year, against $6,013 in 1880 and $6,142 in 1879—reduced by the new road through new country as yet affording little traffic. Its earnings per mile, however, are still much heavier than those of any other Texas railroad, with the exception of the 50-miles-long Galveston, Houston & Henderson, which is the throat through which the Galveston traffic of the whole Texas railroad system has passed until last year, and the San Antonio line.

The earnings per mile of the Texas & Pacific in 1881 were $4,939, of the International & Great Northern about $4,670 (against $3,790 in 1880). In 1880 earnings per mile on leading Texas roads were:

Galveston, Harrisburg & San Antonio	$6,204
Galveston, Houston & Henderson	7,144
Houston & Texas Central	6,013
International & Great Northern	3,790
Texas & Pacific	5,832

The Houston & Texas Central is supported almost entirely by the traffic that originates on its own lines—the produce shipped from and the merchandise shipped to its stations and the travel to and from these stations. It is, to be sure, a link in a through line between the North and Galveston, but the through traffic between Galveston or Houston and the North is not now sufficient to make or mar the fortunes of any important railroad.

Because the main line of this road is in the older and more thickly-settled part of Texas, it is not probable that its business will grow as fast in proportion as that of some newer lines which open fertile and unoccupied parts of the state. But its new "Texas Central" line, extending for 180 miles west and northwest, mostly through agricultural (as opposed to grazing) lands, is likely to get a full share of the growth of Texas, and when the country on it is settled well it must contribute a large addition to the earnings and profits of the Houston & Texas Central Company.

This corporation would probably enjoy more confidence if it were not so extremely economical of the information it makes public. In these days investors are likely to suspect something wrong of the railroad company that withholds regular reports, or makes them much less complete than those of other companies. So far as situation is concerned the Houston & Texas Central appears to command a better local traffic—a greater amount of travel and freight—than any other Texas road. But it publishes no reports of its traffic, and no details of expenses, or of the materials used in road repairs. A few years ago engineers returning from Texas reported the road and road-bed to be in wretched condition. The large increase of expenses since, together with the expenditures of capital charged to "betterments," make it probable that it has been much improved since, but a full report of what has been done is needed to give confidence in the property, which ought to become extremely valuable in course of time if new lines are not too much multiplied, in the territory from which it draws its traffic.

Crop Reports.

The Department of Agriculture has issued revised estimates of the last crop of cotton, showing a total of about 16,500,000 acres, and about 5 per cent. more than in 1880. The product is not reported, but is said to be somewhat more than was estimated by the Department last December.

In the several states the crops were the following percentages of the crop of 1880:

North Carolina	82	Mississippi	80
South Carolina	80	Louisiana	86
Georgia	86	Texas	75
Florida	90	Arkansas	59
Aladama	86	Tennessee	60

From this it appears that the crops suffered most west of the Mississippi. So far, railroad earnings have been much less affected by the great decrease in this leading crop than was to be expected, and by this time by far the larger part of the crop is marketed.

The estimates of the crops of grain have also just been issued by the Department, showing the following for 1880 and 1881:

	Yield, bush.	P. c. less than in 1880.	Acres.	Yield per acre.
Wheat	380,280,000	22	37,709,020	10.1
Corn	1,194,916,000	31	64,262,025	18.6
Oats	416,481,000	⅛	16,831,000	24.7
Rye	20,704,950	27	1,789,100	11.6
Barley	41,161,330	9	1,967,510	20.9
Buckwheat	9,486,200	..	828,815	11.4
Total	2,063,029,570		123,387,470	
Total, 1880	2,718,193,500			
Decrease	655 163,930			

The Department estimate the *value* of the small crop of 1881 to have been $1,465,000,000, against $1,361,000,000 as that of the large one of 1880. But as nine-tenths of the crop is consumed in the United States, the country at large gets the benefit of the higher price for only one-tenth of the crop. Even in 1880, when our exports were largest, they were but 10½ per cent. of the crop. A part of the higher price is obtained for the meat exported, however; but, on the whole, in a year of light exports like this, it is the United States that pays the higher prices on the grain, because it is the United States that consumes the grain. The increase in value is wholly in corn; the wheat (at the Department estimates) being worth $20,000,000 less than the year before; but the average value of corn is reported as 60 per cent. more than last year. Now it is corn especially that is consumed in this country. Of the 1,730,000,000 bushels produced in 1880 less than 100,000,000 (6 per cent.) were exported. Should the proportion of exports be the same this year, then the advance of 24 cents a bushel will cost other countries $27,000,000 and this country $250,000,000.

As by far the larger part of the corn is consumed on the farms, not even do the farmers, as a class, gain much by the higher price. Those of them who have large surplus crops have gained, but those who feed their whole product gain only by the higher price of the animals they market (not of those simply maintained); while those who have to buy corn to feed their animals, who are a large class this year, not only in the South but in Southern Illinois, are, of course, the poorer by the high price of corn.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Central, of South Carolina.—Extended west by north to Sumter, S. C., 18 miles.

Ft. Madison & Northwestern.—Extended from West Point, Ia., west by north to Birmingham, 29 miles. Gauge, 3 ft.

Genesee Valley.—Track laid from Cuba, N. Y., southwest 4 miles.

Leavenworth, Topeka & Southwestern.—Track laid from Leavenworth, Kan., to Stranger Creek, 12 miles.

Lehigh & Hudson River.—Extended northeast to Andover, N. J., 4 miles.

Missouri Pacific in Nebraska.—Extended from Falls City, Neb., north by west to Sheridan, 35 miles.

Shenandoah Iron Works.—Completed from Shenandoah Iron Works, Va., to Fox Mountain ore bank, 6 miles.

This is a total of 108 miles of new railroad, making 419 miles thus far reported for 1882, against 173 miles reported at the corresponding time last year.

CHICAGO SHIPMENTS EASTWARD in the week ending Feb. 11 were 66,499 tons, against 73,425 the previous week and 54,105 in the corresponding week of last year, and 38,443 in 1880. The shipments for the week this year are the smallest since the first week in January, but they are larger than in any week of last year between Jan. 8 and April 10. The shipments from Jan. 1 to Feb. 11 have been, for three years:

	1880.	1881.	1882.
Tons	226,823	360,514	424,041

Thus, the shipments this year have been 17.6 per cent. more than in 1881, and 87 per cent. more than in 1880. If full schedule rates were received on all the freight in the week ending Feb. 11, the gross earnings were about one-fifth less this year than last. Of the entire shipments in this week, the Chicago & Grand Trunk had 17 per cent., the Michigan Central 24.1, the Lake Shore 19.9, the Fort Wayne 21.1, the Pan-handle 10.4, and the Baltimore & Ohio 6.5 per cent. The two Vanderbilt roads have 44 per cent.—much less than before for a long time—against 49 in the late pool, and the two Pennsylvania roads had 32.5 per cent., against 33 in the pool. The chief feature is the extraordinary shipments by the Chicago & Grand Trunk. It has not, on the average, before had more than 10 per cent.—its pool percentage. The total shipments were 10,923 tons more than the Board of Trade reported as billed from Chicago by these roads.

For the week ending Feb. 18 the Board of Trade reports the shipments billed from Chicago to have been 51,831 tons, against 55,576 tons the previous week and 46,180 in the corresponding week of last year. The shipments are the smallest reported since the first week of January; but they were equaled in only two weeks of January and February last year, when the average weekly shipments were 50,322 tons. Last week there was again an extraordinarily large proportion of the grain carried by the Vanderbilt roads (54 per cent.), and an extraordinary proportion of the provisions by the Pennsylvania roads (58.3 per cent.); but there were 42,724 tons of the grain and flour and only 8,112 of the provisions. The Michigan Central alone carried 41.4 per cent. of the flour—44,765 barrels; the Fort Wayne only 11.1 per cent. The Baltimore & Ohio is carrying more than before the advance in rates, but less than its proportion in the old pool.

AN ADVANCE IN EAST-BOUND RATES is proposed from the present basis of 20 cents per 100 lbs. to 25 cents on grain and flour from Chicago to New York. An advance ought to be made if possible; there can be no question of that, for present rates cannot much more than cover the expenses. At this season, however, it has been usual not to advance, but to reduce rates in anticipation of the opening of navigation. This was done in 1880 March 1, but in 1881, not till April 1. The reduction in 1880 was followed by the heaviest shipments out of Chicago that the railroads had ever had, or have had since, except last January. But in 1880 the winter rate was 40 cents and in 1881 35 cents, and when reduced it was 10 cents and 5 cents, respectively, higher than the rate which it is proposed to make now.

Quite probably the grain shipments will be somewhat lighter under a higher tariff. But flour and provision shipments will probably not be affected at all. And as for grain, we have endeavored to show elsewhere that an extraordinarily large proportion of it this year is required for consumption at interior points, and the movement to supply this demand will be very little affected, we imagine, by an advance. The present rate is too low for winter or summer, and can only be justified when it is impossible to get a higher rate. This is the case sometimes when lake and canal navigation is open, but even then usually only for grain. If the trunk lines are to get any part of their support from their immense through traffic they must get more than the present rates. They cannot make much out of it during the current half-year in any event.

THE INTER-STATE COMMERCE BILL, is now in the hands of the House Committeee on Commerce at Washington, and this week the committee is hearing arguments for and against it by interested parties. The bill is substantially the old Reagan bill, we understand, and it is not only important that it should not become a law, but that the members of Congress should be made to understand why its provisions are harmful and unjust. In view of the constantly-changing composition of Congress, and the almost universal ignorance of the principles that govern transportation rates and the practicable means of adjusting them, we cannot expect any wise legislation until that body has some expert official advisers on the subject who will command its confidence. A national railroad commission composed of capable men might collect such information and present such reports on the condition of transportation business, on evils to be overcome and wrongs to be righted, and on the probable effects of proposed legislation, as might prevent the wasting of time year after year on impractical, inefficient or unjust measures, and direct attention to what really ought to be done and can be done. As it is, Congress and most of the state legislatures go through a treadmill, talking about policies proved years ago to their own predecessors to be undesirable, and there is no progress and apparently no possibility of progress.

THE WESTERN TRUNK LINES ASSOCIATION has accepted the proposition of the trunk lines to pay 10 per cent. of the emigrant fares to the steamer lines or foreign agents who sell the tickets, instead of the 25 per cent. which the trunk lines formerly charged, and nothing at all, which was what the Association desired, and indeed what the Association roads have been paying for a few months past. In consequence of this settlement of the controversy, the trunk lines are to cease to discriminate in favor of the Rock Island and the Burlington, Cedar Rapids & Northern in ticketing the emigrants, and treat all the Association roads fairly.

English "Goods" Locomotives.

While there is very much greater variety in the design and construction of English than of American passenger locomotives, the reverse is true of "goods" or freight engines. In this country we have three distinct types of freight locomotives in very general use, the "American," ten-wheeled, Mogul and consolidation. Besides these, there have recently been added others with eight coupled wheels and a four-wheeled truck, and some with ten coupled wheels and a two-wheeled truck. In England, probably four-fifths of all the "goods" engines in use are of the type illustrated by our engravings on another page, and which represent the latest practice in that country; it must be admitted that they are very efficient machines. The similarity in their construction is very striking. The straight chimney and straight-top boiler are universal in Great Britain. The position of the dome, when one is used, near the middle of the boiler is also the general practice, instead of placing it over the fire-box as we do here. The Southeastern engine, it will be noticed, though, has no dome, the steam being taken, it is presumed, through a perforated pipe. The safety valves in the Southeastern and Midland engines are of the Ramsbottom type, with a single coiled spring between the two, which is attached to and acts on a single lever. This design is also generally used in England, and is unknown or at least is not used at all in this country. The cabs of all the engines are made of iron. The "splashers," or wheel guards, as we call them, are attached to outside frames, a practice which has long ago been abandoned here. The difference in the practice here and there is that we place the running-board above the wheels and attach it to brackets bolted to the boiler. The wheel-guards or "splashers" are there suspended from the running board and fastened by other brackets bolted to the frames. It is rare that any part of the outside surface of the wheels here is inclosed by the wheel-guards, the latter being simply a sheet-iron cover over the top of the tire. On the engines illustrated, the locomotive runner and fireman must go outside of the cab in getting from it to the running-board, whereas on American engines, the cabs almost universally have two doors in front, one over each running-board, through which the men have access to the latter.

It will be noticed that each of the engines has solid-end bushed coupling-rods, a practice almost universal in England, and one worthy of imitation here.

On the Northwestern engine the check-valves are not shown. On this line Mr. Webb attaches them to the back head of the boiler, and uses injectors alone, which are arranged so as to stand vertical. Feed-pipes are then carried inside the boiler to a point near the front tube-plate. It is surprising that the manufacturers of injectors in this country do not make some of them to work in this way.

The cylinders of the locomotives illustrated being inside and inclined, they can be brought close up to the front driving axle, and the trailing axle being behind the fire-box, there is very little over-hang at either end. The great objection which would be made to the engines here would be to the inside cylinders and crank axles. To fulfill the same conditions which this engines does, we have adopted substantially the same arrangement of boiler and wheels, but have placed the cylinders outside. This results in considerable overhanging weight at the front end, which is carried on a single axle or "pony" truck in front of the cylinders, and thus makes our Mogul engine.

The principal dimensions of the English engines are as follows:

Dimensions of English "Goods" Locomotives.

	Midland engine.	Southeastern engine.	Northwestern engine.
Cylinders	17½ × 26	18 × 26 in.	17 × 24 in.
Diameter of driving-wheels	62½ in.	61 in.	60 in.
Total wheel base	16 ft. 6 in.	.....	15 ft. 6 in.
Grate area	17½ sq. ft.	.....	15 sq. ft.
Number of tubes	221	230	186
Outside diameter of tubes	1¾ in.	1⅝ in.	1¾ in.
Heating surface in tubes	1203 sq. ft.	1034 sq. ft.	981 sq. ft.
" " " fire-box	110 " "	95.25 " "	87.3 " "
" " " total	1313 " "	1129.25 " "	1018.3 " "
Length of grate	6 ft. 1 in.	4 ft. 10 in.	.....
Width of grate	3 " 4½ "	3 " 4 "	.....
Inside diameter of boiler	4 " 3 "	4 " 3 "	.....
Weight of locomotive in working order	84,952 lbs.	70,830 lbs.	63,168 lbs.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

West Jersey, annual meeting, at the office in Camden, N. J., March 7.

Atlantic & Charlotte Air Line, annual meeting, at the office in New York, March 8.

Pennsylvania, annual meeting, at Musical Fund Hall, Philadelphia, March 14, at 11 a. m.

Dividends.

Dividends have been declared as follows:

Norfolk & Western, 1 per cent., quarterly, on the preferred stock, payable March 15. This is the first dividend. Transfer books close March 1.

Delaware & Hudson Canal Co., 1¾ per cent., quarterly, payable March 10. Transfer books close Feb. 23.

Foreclosure Sales.

The *Savannah, Skidaway & Seaboard* road will be sold by the trustees in Savannah, Ga., March 7, under a decree of foreclosure made by the Superior Court of Chatham County. The road is a short line used for suburban and pleasure travel, running from Savannah to Isle of Hope, with branches to Montgomery and White Bluff, in all about 11 miles. There is also a street line 2½ miles long, in Savannah, and some real estate. The bonded debt is $100,000.

Institute of Mining Engineers.

The annual convention of the American Institute of Mining Engineers began at the National Museum in Washington, Feb. 21, with a large attendance. Mr. Wm. Metcalf, of Pittsburgh, President, occupied the chair, and Mr. T. M. Drowne acted as Secretary. Gen. Sherman, on behalf of the Regents of the Smithsonian Institution, delivered the opening address and was followed by Major J. W. Powell, Chairman of the local committee of arrangements, who made an address of welcome. At the close of the exercises the members of the institute went to the residence of Major Powell, on M street, where a reception was given in their honor. There were many distinguished guests present. A second meeting was held in the lecture room of the National Museum on the morning of Feb. 22. Papers were read by E. F. Loiseau, of Philadelphia, upon the process for making artificial fuel from anthracite and bituminous coal dust and the applicability of the process to the utilization and solidification of the slacking lignites of the West; by W. H. Adams, upon coal in Northern Mexico; by J. C. F. Randolph, of New York, upon the new mill for the Batopilas Mining Company; by Henry M. Hour, upon comparative efficiency of fans and positive blowers, and C. Henry Roney, of Philadelphia, upon a new ore pulverizer.

At the evening session papers were read and addresses made by Gen. Meigs, Capt. Lyle of the Springfield Arsenal, Charles Macdonald and others on the subject of organizing systematic tests of iron and steel, the speakers generally favoring the appointment of a commission by Congress to take charge of and continue experiments with the metal-testing machine at Watertown Arsenal, near Boston.

Western Association, General Passenger and Ticket Agents.

At the adjourned meeting in Chicago, Feb. 16, A. J. Smith presided, Mr. George H. Daniels acting as Secretary.

There were present E. A. Ford, Pennsylvania Company; Wm. Edgar, Great Western; John Egan, Cincinnati, Indianapolis, St. Louis & Chicago; P. Lowell, Chicago, Burlington & Quincy; A. J. Smith, Cleveland, Columbus, Cincinnati & Indianapolis; H. C. Townsend, Wabash, St. Louis & Pacific; W. P. Johnson, Lake Shore & Michigan Southern; B. B. Anderson, Peoria, Decatur & Evansville; M. L. Ettinger, Chicago & Iowa; W. H. Harrison, Columbus, Hocking Valley & Toledo; A. H. Hanson, Illinois Central; A. S. Dunham, Chicago & Eastern Illinois; W. H. Stennett, W. A. Thrall, Chicago & Northwestern; F. L. Whitney, Michigan Central; S. K. Hooper, Hannibal & St. Joseph; A. V. H. Carpenter, Chicago, Milwaukee & St. Paul; B. F. Mills, Burlington, Cedar Rapids & Northern; G. W. Ogilvie, Des Moines & Ft. Dodge; George H. Daniels.

Article 12 of the constitution was amended so that 15 members will make a quorum hereafter, instead of 21 as heretofore. This change was made necessary on account of numerous consolidations that reduced the number of members.

A request from the editor of the Chicago *News Letter*, asking permission to publish the "black list," was read and refused.

It was resolved that the usual basis for making rates to Eastern points shall obtain from St. Louis, Chicago, Indianapolis and Cincinnati, thus restoring the old tariff rates.

The meeting then adjourned to May 10. The place of meeting will be announced by a circular.

Ticket Commissions.

At the meeting in Chicago, Feb. 15, called to consider the means to abolish the practice of paying commissions for the sale of coupon tickets, representatives were present from 25 of the 45 companies that have signed the agreement, while others of them were represented by proxy. The chief action taken was the passage of the following resolution:

"*Resolved*, That each railroad company party hereto agrees that it will not in any way, directly or indirectly, pay commissions or other remuneration to any ticket agent, or to any person for him, who is now or may be in the employ of any railroad company party to this agreement, and that this agreement shall be in force and effect at once."

Mr. W. H. Dixon, the Chairman of the meeting, was directed to send copies of this resolution to all the companies that have signed the agreement of Dec. 15 (to forbid their agents to accept commissions under pain of dismissal), and ask them to indorse it.

The meeting adjourned to meet at the Railway Club-rooms, No. 46 Bond street, New York, Wednesday, March 22. The chief object of this meeting, doubtless, is to organize an association, a proposed constitution for which Mr. Dixon submitted at the Chicago meeting. The following summary of this constitution we copy from the *Chicago Tribune:*

The proposed constitution, after providing for the organization of the National Mutual Railroad Association—the voting power of each member to be based on the basis of one vote for each fifty miles of road, not track—provides that each member shall deposit with the Treasurer $3 for each mile of road operated by it, as a forfeit to the members injured in revenue by any violation of the constitution or rules and agreements connected therewith. Each member agrees that it will not in any way, directly or indirectly, pay any commission or other remuneration to any ticket agent in the employ of any other member of the Association, and each agrees to make an equitable distribution of its coupon-ticket sales among its connections. Any member

convicted of having paid any commission to any ticket agent of any member of the Association shall have its issue of tickets refused by all other members, and all other members shall cease to sell tickets over its road. Every manager signing the constitution pledges himself to discharge any employé violating the agreement, and not to sign any voucher for the payment of any money in violation of the constitution. Each member shall prohibit its ticket agents from receiving any commission from any railroad company, and shall promptly dismiss any who does so. All complaints must be made in writing to the Commissioner, who shall immediately make investigation. All matters connected therewith shall be secret. Should any coupon-ticket-issuing road refuse to join the Association within six months after formation, all the members thereof shall cease selling tickets and checking baggage over such outside road, and refuse to receive any of its tickets. Five persons shall compose the Beard of Arbitrators in case arbitration is desired.

All members of the Association shall, as far as possible, be protected against loss of revenue brought about by the discrimination of ticket-agents, or from the action of outside roads, by reason of its membership in the Association; and when it can be shown that such losses have occurred for at least three consecutive months, and if the Association cannot by united action cause such losses to cease, then the Association shall, by a pro-rata per mile assessment on its constituents, make good the losses that are determined by arbitrators chosen for that purpose to have occurred as above stated. No amount in excess of the amounts that can be conclusively shown to have been lost by reason of the causes stated above shall be paid to the losing company, and no claims for inferential or possible losses shall be entertained. The claims for all loss of revenue under this agreement shall be full and given in detail.

ELECTIONS AND APPOINTMENTS.

Avon, Geneseo & Mt. Morris.—At the annual meeting in Rochester, N. Y., Feb. 14, the following directors were chosen: L. C. Bingham, A. Bronson, H. E. Brown, George Ellwanger, George A. Green, Hugh J. Jewett, H. P. Mills, Wm. Mudgett, George W. Phelps, Willis Phelps, M. F. Reynolds, Archibald McVean, Wm. A. Wadsworth. The road is leased to the New York, Lake Erie & Western Company.

Baltimore & Ohio.—Mr. J. Q. Henrici has been appointed Supervisor of Trains and Assistant Master of Road of the Somerset & Cambria, the Salisbury and the Berlin branches.

Buffalo, New York & Philadelphia.—The following circular from Vice-President J. W. Jones is dated Feb. 14:

"The following appointments have been made, to take effect from and after this date: G. S. Gatchell, General Superintendent; Philip Joyce, Auditor; Wm. S. Baldwin, General Passenger Agent; E. T. Johnson, General Freight Agent; Allen Vail, Superintendent Motive Power and Machinery; J. H. Poole, Purchasing Agent." They are all reappointments.

California & Nevada.—E. M. Walker is President, and E. A. Phelps, Secretary. Office in San Francisco.

Canadian Pacific.—Mr. S. B. Reed, Superintendent of Construction, has been appointed Chief Engineer in place of Gen. Rosser, resigned.

Chattanooga, Columbus & Florida.—At the annual meeting in Thomasville, Ga., Feb. 20, the following directors were chosen: M. I. Atkins, A. Hood, Wm. M. Tumlin, Cuthbert, Ga.; S. G. McClendon, Thomasville, Ga.; W. A Crawford, Asher Jackson, Bainbridge, Ga. The board elected S. G. McClendon President; Wm. M. Tumlin, Secretary and Treasurer.

Chicago, Burlington & Quincy.—Mr. M. J. Roach has been appointed Superintendent of Dining Cars, to succeed J. H. Wall, who has gone to the Pennsylvania. Mr. Roach has been Mr. Wall's assistant.

Chicago & Coal City.—The directors of this new company are: Warren T. Hecox, James J. McCarthy, Josiah W. Preston, George W. Stanford, Chicago; Charles H. Roser, New York.

Cincinnati & Springfield.—This company has elected J. H. Devereux President; M. C. Shoemaker, Secretary; George H. Russell, Treasurer. The road is leased to the Cleveland, Columbus, Cincinnati & Indianapolis.

Delaware, Lackawanna & Western.—At the annual meeting in New York, Feb. 21, the old board was re-elected, as follows: William E. Dodge, Moses Taylor, George Bulkley, John I. Blair, George Bliss, Percy R. Pyne, William Walter Phelps, Wilson G. Hunt, Benjamin G. Clarke, E. W. Holbrook, E. T. Higgins, Jay Gould, Sidney Dillon, Russell Sage. There were 265,267 shares voted unanimously. The board re-elected Samuel Sloan President; Frederick F. Chambers, Secretary; Frederick H. Gibbens, Treasurer.

Ft. Madison & Northwestern.—The officers are: President, J. C. Atlee; Vice-President, H. Ketchum; Secretary, E. W. Merrill; Treasurer, D. M. Kelly; Superintendent, S. B. Kenrick; Chief Engineer, Charles A. Gilchrist; Attorney, J. D. M. Hamilton. Office at Ft. Madison, Iowa.

Messrs. Ketchum, Kelly and Kenrick were formerly connected with the Green Bay & Minnesota road.

Guyandotte Valley.—The officers of this new West Virginia company are: President, Charles Wendell; Vice-President and General Manager, A. H. Canedo; Secretary, W. H. Gray; Treasurer, Samuel R. Earle.

International & Great Northern.—The following appointments took effect Feb. 13: C. W. Koons, Train-Master from Palestine to Longview, from Troupe to Mineola and Overton Branch; headquarters at Palestine. E. O. Man, Train-Master from Palestine to Columbia and Huntsville Branch; headquarters at Houston. K. P. Corbyn, Train-Master from Palestine to Milano Junction; headquarters at Hearne; J. K. Painter, Train-Master from Milano Junction to Lavedo and Georgetown Branch; headquarters at San Antonio.

Kingston & Pembroke.—This company has elected C. F. Gildersleeve President; J. D. Flower, Vice-President. Office in Kingston, Ontario.

Leavenworth, Topeka & Southwestern.—Mr. T. Appleton is Chief Engineer, with office in Leavenworth, Kansas.

Lehigh & Hudson River.—Mr. W. L. Anderson has been appointed Superintendent. He was recently Division Engineer of the Belvidere Division of the Pennsylvania Railroad.

Louisville, New Albany & Chicago.—The new board has re-elected R. S. Veech President; John McLeod, General Superintendent; W. H. Lewis, Secretary and Treasurer; H. T. Curd, Auditor; W. M. Lewis, Purchasing Agent and Paymaster.

Mexican Central.—Mr. A. M. Wellington has been appointed Assistant General Manager in charge of location, appointment taking effect Jan. 4.

Chief engineers and engineers in charge of independent locating parties on main line and branches will report to him on all matters pertaining to location of lines, and respect his orders, unless otherwise directed by the General Manager.

Milwaukee, Lake Shore & Western.—Mr. John Hickey is now Master Mechanic, succeeding S. Charnley resigned. His office is for the present at Manitowoc, Wis.

Missouri Pacific.—Mr. Wm. E. Jones is appointed General Western Freight Agent, with headquarters at Kansas City.

Northern Central.—Mr. John Scott has been appointed General Solicitor, and James A. Logan, Assistant General Solicitor. Offices in Philadelphia.

Pennsylvania.—Mr. Daniel S. Newhall has been chosen Assistant Secretary in place of John C. Nims, Jr., transferred.

Mr. J. H. Wall, who has held the same position on the Chicago, Burlington & Quincy, has been appointed Superintendent of Dining Cars.

Pennsylvania Railroad Leased Lines.—The following officers were chosen at meetings held in Philadelphia, Feb. 21: *Bedford & Bridgeport.*—John Cessna, President. *Mifflin & Centre County.*—J. N. DuBarry, President.

Tuscaloosa, Jasper & Florence.—The officers of this new company are: President, A. B. Tavel, Nashville, Tenn.; Secretary and Treasurer, H. G. McCall, Montgomery, Ala.

Union Depot Co., of Hannibal.—The following officers were chosen last week: President, J. D. Carson; Secretary, T. L. Dunn; Treasurer, W. J. Hilton.

Union Depot Co., of Kansas City.—The following officers have been elected: President, George H. Nettleton; Secretary, W. J. Terry; Treasurer, C. C. Ripley; Superintendent, James D. Carson; Ticket Agent, A. W. Millspaugh; Baggage-Master, H. H. Hale; Executive Committee, George H. Nettleton, A. A. Talmage, S. F. Smith.

West New Hampshire.—At the annual meeting in Keene, N. H., Feb. 15, the following directors were chosen: C. J. Amidon, D. P. Crocker, D. F. Perrin, George Frink, A. B. Harris, E. F. Lane, F. F. Lane. The board elected A. B. Harris President; Thomas E. Hatch, Clerk; E. F. Lane, Treasurer.

Wilmington & Weldon.—Mr. W. A. Riach has been appointed General Auditor, and John R. Latta Assistant Auditor. Offices in Wilmington, N. C.

Wilmington, Columbia & Augusta.—Mr. W. A. Riach has been appointed General Auditor, and John R. Latta Assistant Auditor.

Woodstock.—Mr. Charles M. Marsh has been chosen Clerk in place of O. C. Greene, resigned. Mr. James G. Porter, Superintendent of the road, has been chosen Treasurer also in place of F. W. Clarke deceased.

PERSONAL.

—Gen. Thomas L. Rosser has resigned his position as Chief Engineer of the Canadian Pacific Railway. It is said that he resigns on account of differences of opinion as to the location of the road.

—Mr. J. R. Ledyard has resigned his position as Superintendent and Chief Engineer of the Kentucky Central Railroad, after a service with the company in different positions of over 20 years.

—Mr. John Cooke, for many years Superintendent and afterward President of the Danforth Locomotive Works at Paterson, N. J., died Feb. 20, aged 58 years. A more extended notice of his life will be found on another page.

—Mr. Richard A. Bagnall, Train Dispatcher of the Old Colony road, whose mysterious disappearance from Boston was noted last week, has been traced to New York, and it is believed that he has gone to New Mexico. He had not the handling of any money of the company, but it is now said that his private affairs were in an embarrassed condition.

—Mr. Charles Graham, Master Mechanic of the Bloomsburg Division of the Delaware, Lackawanna & Western road, celebrated his silver wedding by a reception at his house in Kingston, Pa., on the evening of Feb. 13. A large number of invited guests were present and the occasion passed off very pleasantly.

—Mr. C. S. Cone, Jr., General Ticket Agent of the Ohio & Mississippi road, was accidentally killed near North Vernon, Ind., Feb. 17. He put his head out of a window of the car in which he was riding, just as the train was approaching a bridge, and his head struck the bridge timbers, fracturing the skull and killing him instantly.

—Mr. John McCormick, of Altoona, who has been in the employ of the Pennsylvania Railroad since 1854, has resigned his position as Train-Master of the Mountain Division, to take effect Feb. 15. Mr. McCormick is one of the company's oldest employés, and has been a conductor, dispatcher at East Conemaugh and Gallitzin, and for the past seventeen years or more in his late position.

—Mr. Porteous B. Root, who died in New York, Feb. 20, was a civil engineer, and had served in that capacity on the Erie and Black River canals, the Delaware & Hudson Canal Company's railroad in Pennsylvania, the Morris & Essex and the Delaware, Lackawanna & Western roads. An injury from a fall incapacitated him for active work several years ago.

—Mr. Joseph E. Sheffield, well known as one of the wealthiest and most liberal men in Connecticut, and founder of the Sheffield Scientific School of Yale College, died at his residence in New Haven, Feb. 16, aged 88 years. Mr. Sheffield was one of the first projectors of the New Haven & Northampton road, and it was largely through his efforts that the road was build. He was its President for a number of years and owned a large part of the stock until recently, when he sold it to the New York, New Haven & Hartford Company. He was also largely interested in the construction of the Chicago & Rock Island road and its extension in Iowa.

—The Atlanta *Constitution* says: "So much has been published about the late transactions of Gen. Gordon and his brothers and Gov. Colquitt in the railroad business that we might as well put the public straight on the matter. We write from the words of one who knows. It will be remembered that we stated some time ago that these gentlemen had cleared $1,000,000 by their transactions of less than a year. Last Saturday Messrs. Walter S. Gordon and Eugene C. Gordon sold a block of a quarter of a million of their stock in the Richmond & Danville Extension Company at 165 and realized, in actual cash, a trifle over $100,000 each. Gov. Colquitt and Gen. Gordon have not sold any of their stock, and it has advanced to 180 since Messrs. W. S. and E. C. Gordon sold. These latter gentlemen still have an interest in the Richmond & Danville Extension, but have invested largely outside. They bought, last month, the Stanbury cotton factory at Carrolton, Miss., which was built and stocked at a cost of $210,000. It is understood that they bought it at much less than these figures for cash. The Gordons and Gov. Colquitt still hold their stock in the Belmont coal mine. It is said that Gen. Gordon could sell his securities in the Richmond & Danville Extension Company at present figures for considerably over a quarter of a million cash profit. He and his friends are interested in another railroad projected from some point in Illinois to Mobile, Ala. They are investing heavily in Southern enterprises. Besides those noted, Gov. Colquitt and other gentlemen have organized a company for the manufacture of commercial fertilizers It will probably have headquarters at Nashville, Tenn. We are sure all Georgians will be gratified to know that these gentlemen have already realized in actual profits enough to relieve them of every embarrassment and make them more than independent for the rest of their lives—and still have large and appreciating interests yet untouched."

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Month of January:				
Ala. Gt. Southern..	$60,575	$58,508	I. $2,067	3.5
Cairo & St. L.....	32,451	33,037	D. 1,186	3.5
Ches., O. & Southw	15,934	18,897	D. 2,963	15.6
Cin., Ham. & Day'n.	208,376	192,660	I. 15,716	8.2
Des M. & Ft. Dodge	39,792	29,503	I. 10,289	34.8
Det., Lan. & No....	108,207	77,882	I. 30,325	38.9
Louisv. & Nashv...	950,065	812,117	I. 137,948	17.0
Net earnings.	327,735	244,552	I. 83,183	33.9
Minn. & St. L.....	109,671	50,403	I. 59,268	117.6
Nashv., Ch. & St. L.	156,993	178,143	D. 21,150	11.9
Net earnings.....	54,593	40,214	I. 14,379	35.9
Paducah & E'town.	38,607	42,402	D. 3,735	8.8
First week in February:				
Great Western....	$90,727	$93,526	D. $2,799	3.0
Mem. & Charleston	29,341	27,693	I. 1,648	5.9
N. Y. & N. England	52,287	49,038	I. 3,249	6.6
Second week in February:				
Bur., C. R. & No....	$60,516	$25,215	I. $35,301	140.1
Chi. & Gd. Trk.....	37,353	23,965	I. 13,388	55.7
Chi., Mil. & St. P.	362,000	156,996	I. 205,004	130.6
Chi. & Northwest'n	374,719	205,701	I. 169,018	82.0
Chi., St. P., M. & O.	82,715	39,648	I. 43,067	107.7
Col., H. Vy. & Tol.	42,545	39,045	I. 3,500	8.9
Denver & R. G.....	98,930	75,301	I. 23,629	31.5
Hann. & St. Jo.....	41,000	30,719	I. 10,281	33.2
Long Island.....	29,853	28,717	I. 1,136	3.9
Mil., Lake Sh. & W.	17,795	5,794	I. 12,001	207.0
Northern Pacific ..	73,500	19,700	I. 53,800	273.1
St. L. & San Fran.	62,600	34,900	I. 27,700	79.3
St. P., Minn. & Man.	116,000	31,600	I. 84,400	267.1
Tol., Del. & Bur....	17,703	5,801	I. 11,902	205.1
Week ending Feb. 4:				
Grand Trunk.....	£38,727	£34,507	I. £4,220	12.2

Grain Movement.

For the week ending Feb. 11 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets, and receipts at the seven Atlantic ports, have been, in bushels, for the past six years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1877.....	1,419,072	1,111,317	1,906,159
1878.....	2,676,554	2,004,448	4,151,378
1879.....	2,850,118	1,639,882	4,713,985
1880.....	4,279,151	1,997,607	2,377,028
1881.....	2,460,285	1,639,703	2,001,199
1882.....	4,327,788	2,891,409	2,394,381

The receipts of the Northwestern markets, though 75 per cent. less than in the corresponding week of last year, and larger than in any previous year, were 542,000 bushels less than the week before, and were the smallest for four weeks. The shipments of these markets, also 75 per cent. more than last year and larger than in any previous year, were 191,000 bushels less than the week before, and 265,000 less than in the week ending Jan. 28. For the first time for months, this week shows large shipments down the Mississippi, amounting to 380,604 bushels, or 13.1 per cent. of the whole. This is about as much as went this way during the entire nine weeks previous, and a larger amount than in any one week before since June. The Atlantic receipts for the week are the largest since December, are larger than in the corresponding weeks of 1881 and 1880 (when rates were 35 and 40 cents respectively), but very much smaller than in 1879 and 1878, when rates were very low and irregular.

Of the Northwestern receipts for the week Chicago had 33.8 per cent., St. Louis 25.1, Peoria 16.2, Milwaukee 10, Toledo 8.1, Detroit 4.3 and Cleveland 2.5 per cent. There is a notable change in the proportions from what they have been of late. With a decrease of 542,000 in the aggregate of the eight markets, Chicago loses 574,000 and Milwaukee 149,000, while there is a gain of 105,000 at Toledo and 135,000 at Peoria.

Of the Atlantic receipts New York had 44.3 per cent., Boston 30.1, Philadelphia 11.7, New Orleans 6.1, Baltimore 5.4, Portland 1.8 and Montreal 0.6 per cent. The percentage at Boston is probably the largest it ever had. In the whole year 1881, when it did better than ever before, it had 10 per cent. of the whole.

In amount the Boston receipts are also unusual. In but one week of 1881 were they so large. The Baltimore receipts continue extraordinarily small—not a quarter as much as in the corresponding week last year. There is a great increase in the New Orleans receipts. They are the largest of the year, and larger than the aggregate of the four weeks previous; but they are still much less than the average last winter, which was 256,000 bushels a week in January, 253,000 in February, and much more afterwards.

The exports of the week ending Feb. 15 from Atlantic points were 75,301 barrels of flour and 1,093,643 bushels of grain this year, against 120,932 barrels of flour and 2,476,801 bushels of grain in the corresponding week of last year. For the week ending Feb. 11, 61.2 per cent. of the grain exports were from New York, 20.9 from Baltimore, 8 from Boston, 8 from Portland, and 1.9 per cent. from Montreal—none from Philadelphia and none from New Orleans. Of the flour exports, 69.7 per cent. was from New York, 13.4 from Boston, 10.8 from Baltimore, and 6.1 per cent. from Portland.

Notwithstanding the speculation in the Northwest and the exceptionally light Atlantic receipts this winter, the stocks of wheat on hand at the Atlantic are a little larger now than at this time last year, and the stock of corn two and a half times as large. But, including Western and Eastern cities where stocks are held, there is now 9,000,000 bushels (one-third) *less* wheat on hand than at this time last year, and 10,000,000 less than in 1880; and 1,800,000 bushels *more* corn than last year, and 3,000,000 more than in 1880. There are thus no extraordinary accumulations at the Western markets in spite of their speculation, but the contrary—much less than last year or the year before.

For the week ending Feb. 18 receipts and shipments at Chicago and Milwaukee were :

	Receipts		Shipments.	
	1882.	1881.	1882.	1881.
Chicago	1,271,143	604,572	1,396 753	1,087,266
Milwaukee	340,610	116,410	170,301	68,099
Both.	1,611,753	720,982	1,567,054	1,155,365

The receipts of these two places were thus 121 per cent. larger this year than last, and the shipments 35 per cent. more. But the receipts of the week last year were extraordinarily small, owing to snow blockades, and this year, though so much larger than last, they are much smaller than in any previous week of the year except the first, as will appear by the following statement of their receipts each week :

Week to	Bushels.	Week to	Bushels.
Jan. 7	1,517,526	Feb. 4	2,616,804
" 14	2,368,503	" 11	1,893,532
" 21	2,737,963	" 18	1,611,753
" 28	3,061,090		

Thus there was a rapid increase up to the fourth week of January, when the receipts were the largest even known in a winter week, and since there has been quite as rapid a decrease. The farmers evidently took advantage of the high prices and the low rail rates to market their grain. The receipts of the last seven weeks were larger than those of the eight weeks previous, which includes four weeks before the close of navigation, when receipts are usually much greater than at any time in winter.

Receipts at four Eastern ports for the week ending Feb. 18 have been :

Bushels :	New York.	Boston.	Phila.	Baltimore.	Total.
1882	1,118,889	352,350	256,462	178,641	1,906,342
1881	1,086,369	381,557	471,100	614,116	2,553,142
P. c. of total :					
1882	58.7	18.5	13 4	9.4	100.0
1881	42.6	14 9	18.4	24.1	100.0

New York and Boston this year received 77.2 per cent. of the whole, against 57.5 last year; Philadelphia and Baltimore, 22.8 per cent., against 42.5 last year.

Petroleum.

Stowell's *Petroleum Reporter* gives the following statements for the Pennsylvania oil regions for the month of January, in barrels of 42 gallons:

	1881.	1880.	Increase.	P. c.
Production	2,353,551	1,904,113	449,438	23.6
Shipments	1,657,067	1,061,617	595,450	64.1
Stock, Jan. 31	26,716,188	20,110.903	6,605,285	32.8
No. of producing wells	18,400	14,900	3,500	23.5

The production for the month was exceeded in May, June, July and December of last year, but in no other month on record.

The shipments are lighter than in any month since May last, but exceed those of any previous January.

Of the stock on hand 685,651 barrels are reported at wells, 242,465 in private tanks, the balance of 25,788,072 barrels being in the hands of the pipe lines.

Of the production in January, 1882, there was 73.7 per cent. from the Bradford District and 15.9 per cent. from the Allegheny District, making in all 89.6 per cent. from the Northern field. The only other district making any considerable shipments was the Butler, Parker and Clarion District, which produced 6.8 per cent. of the total.

The shipments out of the region were to the following points :

	Barrels.	Per cent. of total.
New York	852,086	51.4
Philadelphia	46,412	2.8
Baltimore	4,240	0.3
Cleveland	493,190	29.7
Pittsburgh	19,309	1.2
Local points	89,545	5.4
Refined at Creek refineries	152,285	9.2
Total	1,657,067	100.0

No shipments are reported to Boston or down the Ohio. Of the oil refined at Creek refineries (reduced to its crude equivalent), 41,531 barrels went to New York, 623 to Philadelphia, 4,147 to Baltimore, 41,197 to Boston, and 64,787 to local points.

Of the total primary shipments, 319,935 barrels were by rail, the balance of 1,337,132 barrels by pipe lines.

Coal Movement.

Coal tonnages for the week ending Feb. 11 are reported as follows:

	1882.	1881.	Inc. or Dec.	P.c.
Anthracite	338,466	444,995	D. 106,529	23.9
Semi-bituminous	91,503	64,134	I. 27,369	42.8
Bituminous, Penna	63,112	54,127	I. 8,985	16.6
Coke, Penna	60,098	43,794	I. 16,304	37.1

The supply of anthracite is still in excess of the present demand, and prices are very unsettled, varying widely from the companies' lists. No plan has yet been made for curtailment of production in March.

No agreement has yet been made by the Pennsylvania and the Baltimore & Ohio for the regulation of the bituminous and gas coal trade for the coming year. It is said that negotiations are in progress.

Coal shipments over the Columbia & Puget Sound road and by sea from Seattle, Wash. Ter., in January were: 1882, 19,137; 1881, 10,417; increase, 8,720 tons, or 83.8 per cent. The shipments for January were the largest ever made in one month.

Chicago and Milwaukee Receipts.

For the first three weeks of February the receipts have been for four successive years:

Chicago:	1879.	1880.	1881.	1882.
Grain, bush	3,941,569	3,794,549	2,954,557	4,660,573
Flour, bbls.	242,617	127,470	286,231	313,888
Hogs, No	388,602	410,289	324,822	350,925
Milwaukee:				
Grain, bush	543,763	762,924	553,220	1,174,837
Flour, bbls	151,713	85,604	160,847	194,968
Hogs, No	36,935	42,192	24,550	29,596

Reducing flour to grain, the receipts of flour and grain in bushels for each of the three weeks of February have been:

Week to	1879.	1880.	1881.	1882.
Feb. 7	2,260,594	1,542,260	2,494,795	3,237,441
" 14	2,223,210	2,164,330	1,939,901	2,670,266
" 21	2,076,013	1,809,716	1,284,932	2,217,555
Three weeks.	6,559,817	5,516,306	5,519,628	8,125,262

For the three weeks the receipts were thus 47 per cent. more than last year and much greater than in any previous year. But it is noticeable that there is a great decrease in receipts from week to week this year, and in the third week of February they were 1,020,000 bushels (31½ per cent.) less than in the first week. Snow greatly reduced receipts in the third week of February last year. In that weeks receipts this year were nearly a quarter more than in 1880, but only 7 per cent. more than in 1879. The receipts are still heavy, however.

Provision Exports.

The values of the exports of meats, lard, tallow and dairy products for January, are reported as follows by the Bureau of Statistics:

	1882.	1881.	Decrease.	P. c.
January	$13,199,531	$15,218,282	$2,018,751	13.3

The values of exports of provisions and tallow (dairy products not included) for the three months ending with January were:

	1882.	1881.	Decrease.	P. c.
Three months	$31,984,298	$38,551,058	$6,566,760	17.0

The values of dairy products alone exported in the nine months ending with January were:

	1882.	1881.	Increase.	P. c.
Nine months	$16,334,511	$21,108,156	$4,773,645	22.5

The decrease in quantities is much greater than that in values. For January and the three months there is an immense decrease in meat exports except salt beef. For the three months the quantities, in pounds, have been :

	1881-82.	1880-81.	Inc. or Dec.	P. c.
Fresh beef	15,540,131	31,093,721	D. 15,553,590	50.0
Salt beef	17,484,381	11,312,314	I. 6,172,067	54.5
Tallow	12,683,738	18,253,016	D. 5,569,278	30.5
Total cat. prod't.	45,708,250	60,659,051	D. 14,950,801	24.7
Bacon	149,778,319	238,503,503	D. 88,725,184	37.2
Hams	9,640,439	24,810,051	D. 15,169,582	61.1
Lard	84,220,405	112,762,627	D. 28,542,222	25.4
Pork	26,298,807	34,178,108	D. 7,879,241	21.0
Total hog prod	269,938,060	410,254,289	D.140,316,229	34.2
Grand total	315,646,310	470,913,340	D.155,267,030	33.0

With this decrease of 33 per cent. in the quantities exported in these months, there was a decrease of but 17 per cent. in the values.

The hog products exported are nearly seven times as great as the cattle products this year, and were nearly eight times as great last year.

In dairy products there was a decrease of 76 per cent. in butter and of 36 per cent. in cheese in January, and for the nine months a decrease of 51 per cent. in butter and of 6½ per cent. in cheese.

East-Bound Rates.

At a meeting of Western freight agents in Cleveland, Feb. 21, it was unanimously agreed to recommend to the joint executive committee, through Commissioner Fink, an advance in east-bound freight rates between Chicago and New York on the basis of five cents a hundred on the seventh and eighth classes, to take effect on March 6.

The Disabilities of the Mississippi Barge Lines.

The danger of a diversion of traffic from the railways by grain barges on the Mississippi has been somewhat exaggerated. The success of barge transportation would be greatly promoted by paying cargoes of freight for the return trips up the river. Return cargoes are not to be depended upon. Very rarely can any be secured; and the cost of towing the clumsy barges up the river, with their high houses in the wind, is great. The tow-boat consumes 800 tons of coal on the round trip; all expenses are heavy, and the time spent in the round trip is thirty days, making the charges for interest and depreciation oppressive. It has been discovered, furthermore, that even the largest patterns of barges are not large enough to secure the prime object of cheap transportation. The latest barges are 225 ft. long, 35 wide, and 9 deep, with a cargo-house on deck. They are large boats. They carry 60,000 bushels of grain. They are so large that no steamer can take over five of them—that is to say, not over 300,000 bushels of grain at one trip; and, as a rule, no steamer can handle more than 140,000 bushels at a trip advantageously, and that is not a shipment large enough to secure the cheapest transportation. Unless, therefore, the whole system of barge transportation is completely revolutionized by the substitution of an entirely different class of boats, which are at the same time larger and easier to handle, the boats are not likely to meet with more than moderate success. Certainly, there is no immediate prospect of the commercial supremacy of New York being shaken by them.—*New York Tribune*, Feb. 18.

THE SCRAP HEAP.

Locomotive Building.

The New York Central & Hudson River shops at West Albany are building several shifting engines for the road. The Buffalo shops are building two more of the same class.

It is said that the Baldwin Locomotive Works in Philadelphia have taken an order for 60 locomotives for the Pennsylvania Railroad.

The Rhode Island Locomotive Works in Providence last week delivered three new engines to the Eastern Railroad.

The Rogers Locomotive Works at Paterson, N. J., are completing an order for several Mogul freight engines for the Cincinnati, New Orleans & Texas Pacific Company. They are also building several engines for the Pensacola & Atlantic road.

Car Notes.

The Wason Manufacturing Co., at Brightwood (Springfield), Mass., has nearly finished two parlor cars for the Housatonic road.

The Malleable Iron Works at Youngstown, O., are making a large number of patent car couplers for E. Phillips, of New Castle, Pa., the patentee.

Brown, Bonnell & Co., at Youngstown, O., have added to works a shop for making coupling links and pins.

The Harrisburg Car Manufacturing Co., at Harrisburg, Pa., is now turning out 14 box cars a day, two a day being refrigerator cars. The property of the company is thus described in a recent number of the Harrisburg *Patriot:* "The company now owns 58 acres of valuable city land located as follows: 33 acres north of the Pennsylvania Railroad from Broad to State streets, upon which the car works are erected, 22 acres on Allison's Hill, where the foundry and machine works are located, and three acres opposite the Wister Furnace, where the company's large saw mill is located The principal buildings comprising the car works plant are imposing in their dimensions and architectural appearance, consisting of three construction shops, one 60 by 282 ft., one 60 by 200 ft. and one 40 by 211 ft. in dimensions; foundry, 62 by 220 ft.; machine shop, 61 by 120 ft., two stories; blacksmith shop, 45 by 261 ft., containing 46 forges, 5 steam hammers and an immense drop hammer of 2,500 pounds power; repair shop, 38 by 100 ft.; frame shop, 60 by 200 ft., two stories; planing mill, 80 by 110 ft.; engine and boiler house, 40 by 80 ft.; office, 40 by 41 ft., two stories; warehouse, 26 by 40 ft., two stories, used for storing car springs and fine brass castings; together with a host of other buildings which, with a few exceptions, are brick structures, and all are roofed either with slate or tin. There is on this property a large smelting furnace belonging to the company, but at present out of blast. The foundry and machine works on Allison's Hill are comprised in a series of buildings, five of which are 60 by 200 ft., and one 50 by 200—all two stories. These contain foundry, machine, boiler, tank and finishing or setting up shops and the warehouse and counting rooms of the concern. The remaining buildings are one-story structures, adapted to forging, storage of raw material and other departments. All the buildings are connected with each other by railways which form a junction with the Philadelphia & Reading Railroad. To produce the enormous daily output requires the labor of over 1,000 men and boys. The daily consumption of material foots up 55,000 feet of lumber, most of which is Southern pine; 30 tons of wheel, 23 tons of bar, 11 tons of axle and 17 tons of pig iron. The company does not forge its own axles but makes all their own wheels, casting 120 a day."

Bridge Notes.

Bids will be received until March 1 by J. Wainwright, Chief Engineer of the Pittsburgh, McKeesport & Youghiogheny Railroad, at his office, No. 77 Fourth avenue, Pittsburgh, Pa., for the construction of a bridge over the Youghiogheny River at McKeesport, Pa. The bridge is to have two spans of 90 ft. each; one of 236 ft.; two of 137½ ft. each; one of 68 ft., and five spans of iron girder (one 36 ft., one 34 ft. and three 32 ft.) on iron trestle supports.

The Iron City Bridge Works, in Pittsburgh, have a number of contracts to fill and are very busy.

Iron and Manufacturing Notes.

The new blast furnace at the Shenandoah Iron Works in Page County, Va., is nearly completed.

The Pawtucket Manufacturing Co. at Pawtucket, R. I., is putting up machinery for making bolts, nuts and washers.

The rail mill of the Philadelphia & Reading Coal and Iron Co. at Reading, Pa., is making steel rails from imported blooms.

The Chestnut Hill Iron Co. has two of its furnaces at Columbia, Pa., in blast, and will start up the third as soon as the repairs upon it can be completed. The ore used is brown hematite from the company's mines.

Work is progressing on the new steel rail mill of the Indianapolis Rolling Mill Co. The main building will be 216 by 300 ft., and the mill will have a capacity of 600 tons of rails a day when running double time.

Maiden Creek Furnace at Lenhartsville, Pa., has been repaired and put in blast.

Grace Furnace of the Brier Hill Coal & Iron Co. near Youngstown, Pa., is making 125 tons of iron a day.

Willie Roy Furnace at Rose Point, near Youngstown, O., has been leased to Samuel Burnside and others and will soon be put in blast.

The Rail Market.

The *Iron Age* says of steel rails: "It is difficult to quote prices with accuracy, as much depends upon time and place of delivery, size of order, terms of payment, etc. There is no doubt, however, as to the fact of prices being lower, so that $55 offered by a good buyer would be likely to find ready takers. Buyers appear somewhat uncertain what course to take, and there is not the same urgency to place orders as prevailed a year ago, notwithstanding the fact that prices are about $5 per ton lower. Indications favor the impression that railway building and renewals will not be equal to last year, although by keeping out foreign rails there may be sufficient work to give full employment to all the American mills. There is no room for foreign rails, however, and the reductions in prices have been made with a view of meeting centingencies of this kind. Quotations are nominally $56 to $58 at mill, but, as stated, lower prices would be accepted for large lots."

In iron rails very little business is reported. Quotations continue at $48 per ton at mill for heavy sections, and $49 to $52 for light rails.

Spikes are still quoted at $3.10 to $3.15 per 100 lbs., though it is said large orders can be placed at $3. Fish-plates and track-bolts are unchanged.

Old iron rails are quiet and nominal at $31 per ton in Philadelphia for tees, and $32 to $32.50 for double-heads.

Prices of Scrap.

Pittsburgh quotations are $33 to $35 per net ton for wrought scrap; $38 to $40 for old car-springs and axles; $22 to $23 for wrought turnings. Crop-ends (steel) are $31 to $31.50.

Old car wheels command $30 to $32 per gross ton; cast borings, $16 to $17.

The demand for most kinds of scrap is reported good and the market fairly active.

Color-Blindness.

The Delaware, Lackawanna & Western Company has recently caused its trainmen to be examined for color-blindness. Several men with defective eyesight were found, including one brakeman who had been on the road 18 years. They have been discharged.

Two brakemen were also discharged because it was found in the course of the examination that they could not read.

Continuous Brakes in France.

A correspondent of the *English Mechanic* gives an abstract of a very interesting paper read by M. Jules Morandière before the Société des Ingénieurs Civils, in Paris, giving the results obtained from the use of the Westinghouse automatic brake on the Western Railroad of France.

"M. Morandière has now had the Westinghouse brake in actual service for several years, and it becomes interesting to know the facts which have been obtained from its daily working.

"It should be mentioned that upon this railroad the intercommunication system in addition to, and in conjunction with, the brake apparatus is in most successful operation. By pulling a cord or handle placed in each compartment, alarm whistles are sounded upon the engine and in each van, by the use of compressed air, and at the same time a whistle on the top of the vehicles indicates from whence the alarm was given; therefore, by means of the automatic brake, an excellent communication is provided between passengers and servants, as decreed by the Act of Nov. 15, 1846, and by the Ministerial Circular of Sept. 13, 1880.

"Several cases, the report tells us, have occurred in which necessary and satisfactory use has been made of this communication.

"In an appendix a list is given of accidents which are known to have been avoided by the use of the automatic brake upon the Western Railroad, and includes one collision, five persons walking on or crossing the line not at stations; five persons crossing the line in stations; one case of an obstacle unexpectedly found on the line; two cases of vehicles standing or being shunted and not removed from the main line in time.

"The great advantage of an efficient brake is clearly shown from the fact that, in several instances, the trains were pulled up within a very few metres of the obstruction in person.

"The report also furnishes evidence that the brake works efficiently, and is also cheap to maintain.

"In conclusion, I will briefly call the attention of your readers to the very great progress which the French railroad companies are making in the adoption of efficient

brakes, especially since the Minister of Public Works issued the celebrated circular of 13th September, 1880.

"Many systems of continuous brakes have been tried and tested in France, and their engineers have had the great advantage of inspecting those in use in other countries, especially England, Belgium and America; and from the following extract from the latest official list your readers will see that the Westinghouse automatic brake has been almost unanimously adopted for the French railways:—

"Statement showing the amount of rolling stock fitted with the Westinghouse brake, including that portion in course of being fitted:—

FRENCH RAILWAYS.

	Engines.	Carriages.
Western Railway	552	3,960
Ceinture Railway (Paris)	...	108
Eastern Railway (Paris)	80	400
Paris, Lyons & Mediterranean	441	1,447
Orleans	280	880
Midi	45	290
State Railways	12	108
Rhone	6	...
Total	1,416	7,193

The Ceinture Railway Company does not possess any engines, and the locomotive power is supplied by the Western Company.

The fact that in a very short time 1,416 engines and 7,193 vehicles will be in daily use, fitted with brakes which fulfill the conditions laid down by the Minister of Public Works, is most satisfactory.

Railroad Alarm Signal.

The London *Engineer* gives the following information concerning the form of signal in use on the Emperor Francis Joseph Railroad, of Austria:

"The railway alarm signal for passengers consists of rods under every carriage, coupled together and communicating by a system of cords and pulleys with the steam whistle. Other cords passing round pulleys are attached to the rods, and are led to each compartment, the ends being protected by a frame closed by a sheet of paper. This paper must be burst open before the signal can be given by the passengers. Paper, it may be mentioned, might be employed in many similar situations, as, for instance, in railway carriage communicator boxes, and in the door-key boxes in the Covent Garden Theatre instead of glass."

Danger from Lightning in Blasting.

Although the accident in the tunnel in process of construction at Union Hill by the New York, Ontario & Western Railroad Company, which took place on Tuesday afternoon, was happily attended with no loss of life or serious injuries to the men employed in the shaft, it reads a new lesson as to the firing of charges of powder by electricity, and one that should be carefully noted by railway and civil engineers, and even by the torpedo service of the United States. The exact cause of the explosion has scarcely been fully and accurately set forth by the reports of the affair. It appears that the wires usually employed to supply the electric lamps in the excavation were used for the purpose of firing the charges, being disconnected from the electric light system for the moment and connected with the explosives. As a rule, six charges were fired together, those of the afternoon relay of men being exploded at very regular hours—the last six usually at 5:45 p. m. There were only 16 men in the shaft, and the work of connecting the wires had commenced, when the flash of lightning that occurred at 5:42 p. m. suddenly charged the conductors and produced the explosion. There were two flashes of lightning between the hours of 5 and 6 o'clock Tuesday afternoon, the first taking place at 5:23 and the second 19 minutes later. The former, according to testimony elicited by our reporter, simply caused a slight perturbation of the lights in the tunnel, but did not extinguish them. Five minutes later the work of disconnection and reconnection began, but only two of the six charges where ready for the pressure of the button when the last flash interrupted the proceedings. The fact that the time of the explosion corresponded to the second with that of the aerial electrical discharge furnishes indubitable evidence that the accident was not caused by any carelessness on the part of the electrician in charge, and exonerates all parties from blame. At the same time it should be remembered by engineers in charge of such work that atmospheric electricity cannot be altogether disregarded in such cases, and that as a source of accident it may at any time prove dangerous. The concurrence of circumstances on Tuesday was particularly fortunate. In the first instance only two of the six charges had been connected with the firing battery, and in the second the rock in which the charges were inserted was so peculiarly soft and porous as to deaden the force of the eight pounds of giant powder thus prematurely set off. Had the cartridges been set in the harder and more solid rock of the east heading, instead of the west, and the explosion taken place there, probably not a man in the shaft would have escaped destruction. The lesson to engineers is one of no less importance than if the whole number of men had been killed, and should lead to the exercise of great care and precaution at times when the air is charged with electrical energy.—*New York Times, Feb.* 23.

The First Pullman Cars.

The Chicago *Tribune* of Feb. 17 says: "It has been the general impression that the Michigan Central and the Chicago, Burlington & Quincy railroads were the first roads to run dining-cars on their trains. Investigation, however, shows that to the Chicago & Alton belongs the honor of having first inaugurated the dining-car system. The Michigan Central and Burlington did not put on dining-cars until 1875. The Chicago & Alton put dining-cars on its line between Chicago and St. Louis in 1868. The cars at that time were run clear through, and not put on, as at present, during meal hours. These cars were constructed and managed by Mr. Pullman, and the price for a meal was $1. Afterwards the Alton acquired an interest in the dining-cars, and about four years ago it assumed full control of them, and reduced the price for a meal to 75 cents, the same as is now charged by all the other lines.

"The Alton is also the first road which ran Pullman sleeping-cars. The first Pullman sleeper was placed on this line in 1859. This sleeper was called the 'Pioneer,' and was built in an old shanty on Harrison street, in this city, by Pullman & Field. The 'Pioneer' is still running on the Alton, although it has been entirely remodeled and reconstructed. The first Pullman palace cars with folding berths were placed on the Alton in 1872. These cars were much heavier than those now in use. The Alton also claims the credit of having placed on its line the first Harton chair-cars, which was in 1877.

"When the Alton adopted these new features it was ridiculed by other lines, as it was not then believed that they would ever become popular. Their success, however, was soon established, and all the lines, one after another, were compelled to make the same improvements."

Profits on Railroad Contracts.

A firm of contractors, who have built hundreds of miles of railway track, recently received a letter from a prominent railway official, telling how a few dollars may be made out of a contract. The letter is as follows: "A friend of mine is building 200 miles of railroad in Nevada. He sold the first 31 miles of bonds to New York bankers at 80 cents, 8 per cent, 50 year bonds, but will get 90 cents for the balance of the 170 miles, he will have about $200,000 in cash from subscriptions along the line. He has 17 miles of rails laid, 14 more graded, and the ties on the ground. There will be a cash profit in building the road of $450,000. He also has a majority of the stock. He wants $60,000 for working capital for a year. You can then have your money back, and within a year and a half your profit would be $150,000, and also $600,000 of stock. I know at the East stock is often considered of not much value, but this company will get 20 cents per ton per mile for freight and 10 cents per mile for passengers, and the road will pay for itself very soon. You would be astonished to know of the immense traffic the road would have, and your stock would be worth par in a short time. But your cash profit alone would be a nice little fortune."—*Cleveland Herald.*

He Took It All Back.

"Do you mean to call me a liar?" asked one rival railroad man of another railroad man during a dispute on business they had on Austin avenue yesterday.

"No, Colonel, I don't mean to call you a liar. On the contrary, I say you are the only man in town who tells the truth all the time; but I'm offering a reward of $25 and a chromo to any other man who will say he believes me when I say you never lie," was the response.

"Well, I'm glad you took it back," replied the other party as they shook.—*Galveston News*

OLD AND NEW ROADS.

Boston, Hoosac Tunnel & Western.—It is announced that the Continental Construction Company has finally completed the transfer of its interest in this road to the new Boston and London syndicate, which promises to complete this road to Buffalo and Oswego.

Boston, Lowell & Concord.—Counsel for the Boston & Lowell Company have filed a bill for the removal of the suit of Burke against the Concord Company and others from the New Hampshire Court to the United States Circuit Court. The grounds alleged for the removal are that the amount involved is $50,000; that the controversy presented by the bill in equity arises between citizens of different states; that the controversy is capable of being divided, and that the point relating to citizens of other states must be settled by the Circuit Court of the United States. Judge Foster, in behalf of all the defendants in this bill in equity, has filed another petition for removal of the bill in equity to the Circuit Court of the United States, alleging that the amount in dispute is $50,000, and that the controversy arising upon the bill in equity arises under the constitution and laws of the United States. Judge Foster has also, in behalf of the Concord Railroad, filed another petition for the removal of Wm. E. Chandler's petition for a writ of *mandamus* to the Circuit Court of the United States, alleging that the amount in dispute is $50,000, and that the controversy is one arising under the constitution and laws of the United States. Counsel for the plaintiff in the Burke suit have complied with the recent order of Chief Justice Doe, requiring briefs before Feb. 20 as to the materiality of the 16 propositions submitted by the defendants. Briefs have been furnished the Court for plaintiffs.

Boston & Maine.—The Boston *Traveller* says: "The proposition to elevate the tracks of the Boston & Maine Railroad, in this city, now being heard by the Legislative Committee on Railroads, is drawing out expressions of opposition very generally, as the public, and especially that part of it that travels over the Northern roads, believe that the time is now ripe for the establishment of a union passenger station for the four roads that enter that part of the city. Such a move would be beneficial to all the companies as regards grade crossings, and in many other respects also. The amount that it is proposed to expend for the elevation of the Boston & Maine tracks would, it is said, go far toward the construction and equipment of just the building needed."

California & Nevada.—Work has been begun on this road, which is to run from Oakland, Cal., to Bodie, about 250 miles, passing through the Livermore and San Joaquin valleys.

The company has executed a mortgage upon its projected line to the Central Trust Company, of New York, to secure an issue of $5,000,000 bonds, to bear 6 per cent. interest.

Canadian Pacific.—The report of the Minister of Railways and Canals, recently presented to the Canadian Parliament, contains a condensed statement of the present condition of the Pacific Railway, as follows:

Eastern Section—From Callendar Station, the first 50 miles of the line westward has been located and the work of construction commenced.

Central Station—West of Winnipeg the line has been located as far as Moose Jaw Creek, a distance of 404 miles from Winnipeg.

The company having been permitted to abandon the old location from Stonewall to Portage la Prairie, has constructed a new line, about 53 miles in length, running direct from Winnipeg to Portage la Prairie.

On this central section the company has completed the grading for about 218 miles of the line and laid 163 miles of track westward out of Winnipeg, the line from Winnipeg to Stonewall, about 20 miles, being retained by the company as a branch.

The road is open for traffic to a point on the main line 161 miles west of Winnipeg.

From Winnipeg southwesterly, passing to the vicinity of Turtle Mountain, a branch of about 220 miles in length has been located. On this branch construction is far advanced for 89 miles.

From Brandon, another branch, passing in a southwesterly direction, has been located for a distance of about 195 miles.

The company have had a staff of engineers employed examining the various passes of the Rocky Mountains south of the Yellow Head Pass, to ascertain if any more favorable point of passage exists than that already determined.

On June 9, 1881, the Canadian Pacific Railway Company acquired all the rights of the Canada Central Railway, and incorporated its works with those of the Canadian Pacific Railway system.

	Miles.
Ottawa to Carleton Place	29
Carleton Place to Pembroke	76½
Pembroke to Callendar Station (C. P. R. junction)	130
Total	235½
Carleton Place to Brockville (branch)	45½
Total	281

By this arrangement the main line of the Canadian Pacific Railway has been extended eastward from Callendar Station to Ottawa, and its total length from Port Moody increased to about 2,864 miles.

The men in the shops at Winnipeg, Man., have struck for higher wages and regular pay-days. They say that the prices of provisions, etc., and rents have gone up very much, while wages have been reduced.

Central, of Georgia.—As the controversy concerning the Ocean Steamship Company and the proposed issue of new securities seems to be not clearly understood by some, a little explanation as to this company's relations to the Steamship Company may be of service.

The Ocean Steamship Company provides the Central Railroad with an ocean outlet from Savannah, and its ships were formerly owned by private parties. Their interests and those of the road were so conflicting that the Central Railroad purchased the ships, in order to secure harmony of operation. After the purchase, it was ascertained that the charter of the company did not permit them to own ships, and, in order to avoid difficulty, a new company was organized, the Central Railroad becoming virtually the sole holder of the stock. The charter of the company provided that the railroads of the state could subscribe to its stock. Since the organization of the Ocean Steamship Company the President of the Central has been the President of the Steamship Company, while practically the Central Railroad managed the steamers, the board of directors of the Steamship Company acting only in accordance with the suggestions made by the board of directors of the Central, and the directors being usually (or a majority of them members of the Central Railroad board.

At the last election an issue was made upon the policy heretofore pursued by the company of restricting its obligations, and an effort was made to distribute the Ocean Steamship Company stock to the stockholders of the Central, although previous the steamship property had been regarded simply as an asset of the Central Company, as it undoubtedly was. The plan adopted was to issue an interest-bearing certificate of indebtedness for $3,500,000 to the Central Company, which was to form the basis of a distribution to its stockholders. Mr. Wadley, who had opposed the measure throughout, declined to sign the certificate as voted by the board, and resigned the presidency of the Steamship Company, the resignation not at all affecting his position as President of the Central Company.

As already noted a suit has been begun to enjoin the issue of the proposed certificate of indebtedness.

Camden & Atlantic.—The annual meeting of this company was to be held on Feb. 23, when it was expected that there would be a lively discussion. It is said that two propositions have been made for the purchase or lease of the road, one, as heretofore noted, by the Pennsylvania Railroad Company, the other by the New Jersey Central. The latter company desires, it is said, to extend the Medford Branch to a connection with its New Jersey Southern line, in order to use the road as a line between Long Branch and Philadelphia.

Central, of New Jersey.—It is said that surveys are to be made for a loop line of the Long Branch Division from Middletown to Long Branch by way of Port Monmouth, Chapel Hill, New Monmouth and Atlantic Highlands.

A very lively contest is going on over the control of this company. Under the law no stockholders' meeting has been held since the road passed into the hands of a receiver, but it is expected that the receivership will be ended before the regular time (in May) for the annual meeting, and that a new board will then be chosen. The present board, including Jay Gould, have announced that they are willing to be re-elected, and it has been for some time understood that Messrs. Garrett, of the Baltimore & Ohio, and Gowen, of the Reading, had, through their friends, been buying largely of the stock. Indeed, some of their party announced that they had secured a majority of the stock. Probably this announcement was premature; at any rate it stirred up the Gould-Lathrop party, who compose the present board.

Last week it was found that the New Jersey Legislature had, without much debate, passed a brief and apparently unimportant bill, which provided that any railroad company in the state could issue new stock for the purpose of retiring its bonds, and to an amount equal to the bonds which could be converted or called in. It was suddenly discovered that under the provisions of this bill bonds enough could be called for payment or conversion to admit of the issue of 80,000 shares of new stock, which would be under the control of the Gould-Lathrop party. The bill had not yet been signed by the Governor, and a sudden pressure was brought upon him to veto it. Up to date he has not signed it, and he has intimated his willingness to give its opponents a hearing before doing so. In New Jersey, however, a simple majority is sufficient to pass a bill over a veto, and it is not unlikely that it will become a law in any event.

The Garrett-Gowen party, anticipating this, has procured an injunction from the New York Superior Court to restrain the officers of the company from converting any bonds or issuing any new stock. It is not very clear, however, that this New York injunction is binding on a New Jersey corporation, and it will probably amount to nothing. Other legal proceedings may be taken, however, which may be more effective, and, at any rate, the issue of new stock cannot be made, while the receivership continues, without authority from the Chancellor.

There are yet more than two months before the meeting, and that is time enough for many new moves on either side. Both parties are determined, have plenty of both money and astuteness and are stubborn fighters, and an interesting contest is to be expected.

Central, of South Carolina.—This road has been completed and trains began to run over it Feb. 22. It is 35 miles long, from Lanes, S. C., on the Northeastern road, to Sumter on the Wilmington, Columbia & Augusta. It has been built for local business but might be used as part of a new line between Charleston and Columbia.

Central Vermont.—The hearing before the Vermont Supreme Court in the Langdon case has been set over to the May term at Montpelier.

Chattanooga, Columbus & Florida.—The line projected by this company is from Chattanooga, Tenn., by Rome, Columbus, Cuthbert and Bainbridge in Georgia to Tallahassee and Gainesville in Florida, on a line as near an air line as the nature of the country will permit. The company has secured the right of way from Bainbridge to Columbus, and has some grading done.

Chicago & Coal City.—This company has filed articles of incorporation to build a railroad from Chicago to Coal City in Grundy County, Ill., about 60 miles. The line will be nearly parallel with the Chicago & Alton.

Chicago & Northwestern.—Reports of a new issue of stock by this company are contradicted by President Keep, who says there is no basis whatever for the statements.

Chicago, Portage & Superior.—The complaint in the suit begun against this company by R. R. Cable (purchaser of the Jackson stock) alleges that the old management has issued stock and bonds without consideration and in an illegal manner, with the object of keeping control of the property and securing profit from the building of the road. It is charged that the books of the company have

been concealed and that the company has failed to keep an office as required by law. It asks that the issue or transfer of any bonds or stock be enjoined; that the officers of the company be required to keep its books in a place accessible to stockholders and the public, and that a receiver be appointed pending the settlement of the questions relating to ownership of the stock.

Cincinnati Northern.—Regular trains now run through from the Cincinnati terminus to Dodd's (formerly Utica), 36.2 miles. Connection is made at Dodd's with the Toledo, Delphos & Burlington roads.

Florida Western.—Surveys are being made for this road, which is to run from a point on the Louisville & Nashville road in Pensacola, Fla., south and west to the Alabama line, a distance of 15 miles. A branch will also be built to the Pensacola Navy Yard, on the line of the old Pensacola & Barrancas road.

Ft. Madison & Northwestern.—This road has been completed to Birmingham, Ia., 41 miles from the starting point at Ft. Madison, and 29 miles beyond the old terminus at West Point. Work is progressing steadily, and the company intends to complete a considerable length of road this year. It is not yet decided whether the road will go to Sigourney or Oskaloosa. The road is of 3 ft. gauge, and is laid with 30-lb. rails.

Genesee Valley.—Work is progressing on the southern end of this road, and the grading is completed from Hinsdale, N. Y., to Cuba, seven miles, and track is laid for four miles from Cuba.

Grand Southern.—This company will ask the New Brunswick Legislature for authority to consolidate with other companies, and to extend the road to a convenient point on the St. Croix River; also to join in building a bridge over the St. Croix River between St. Stephen and Calais, Me. The bill also gives power to the company to take lands for additional terminal facilities.

Grand Trunk.—The Northern Transit Company has brought suit to recover damages from this company for breach of contract in not furnishing cars and other facilities under a contract for exchange of business made in 1879.

Greenwich & Johnsonville.—Negotiations are pending for the sale of this road to the Boston, Hoosac Tunnel & Western Company. It is a local line, running from Greenwich, N. Y., to Johnsonville, 17 miles.

Hannibal & St. Joseph.—A dispatch from St. Louis, Feb. 19, says: "The Sinking Fund Commissioners of this state have received a letter from the Hannibal and St. Joseph Railroad Company asking for a conference with a view to settling the differences between the company and state without litigation. No time for a meeting was named, but the probabilities are one will soon be held, when the Commissioners will consider any proposition the company may make."

Hartford & Connecticut Western.—It is reported that this road has been sold to the owners of the Rbinebeck & Connecticut road. The last-named line was sold under foreclosure some time ago, and it was then understood that the Delaware & Hudson Canal Company was chief owner of the bonds.

High Water.—The heavy rains of last week and the quick and early melting of the snow have resulted in very high water in the Ohio and the Missouri and their tributaries. Much trouble is reported on the railroads in Ohio, Indiana, Southern Illinois and Missouri. It many places the roads were blocked by land-slides and wash-outs, and in some places traffic was suspended for nearly a week. The storm gave fair warning, however, and but few accidents have been reported.

Indiana, Bloomington & Western.—It is reported that this company will build a branch from its Eastern Extension to Cincinnati, making a new line between that city and Indianapolis. It is also reported that the company is negotiating for the use of the Cincinnati, Hamilton & Dayton line between Cincinnati and Indianapolis.

Iron Valley & Pennsylvania Line.—Surveys have been made for this road, the proposed line being from the Baltimore & Ohio near the mouth of Raccoon Creek, in West Virginia, to the Pennsylvania state line at the intersection of Big Sandy Creek. The line is about 40 miles long, through a region abounding in coal, iron ore and fire-clay.

Leavenworth, Topeka & Southwestern.—This road is now graded from Leavenworth, Kan., to Union township, 20 miles, and track is laid to Stranger Creek, 12 miles, and is steadily advancing. Grading is in progress to Topeka, 57 miles from Leavenworth, and the company expects to reach that point by June 15. The line is being located from Topeka to Salina, 120 miles. It passes through the thickly-settled and most fertile part of Kansas, and is intended mainly for local business.

Lehigh & Hudson River.—Track on this road is now laid to Andover, N. J., 22 miles from the starting point at Belvidere, and regular trains will be put on in a few weeks. The road connects with the Sussex Railroad at Andover, and it is, we believe, the intention to use the Sussex tracks for the present from that place to Franklin Furnace and Hamburg Junction. From Hamburg Junction it is already in operation to Greycourt, the junction of the main line and Newburg Branch of the Erie, so that there is now a continuous line of rails from Belvidere to Newburg. The company will build its own line from Andover to Hamburg Junction.

Louisville, New Albany & Chicago.—Grading is being pushed on this company's Chicago & Indianapolis Air Line. The road is graded from Rensselaer, Ind., to Broad Ripple, and tracklaying has been begun in both directions from Frankfort.

McLean, Havana & Quincy.—This company has filed articles of incorporation to build a railroad from LeRoy, in McLean County, Ill., by Havana to Quincy, about 145 miles, with a branch to Bloomington, about 10 miles. The office is in Havana, Illinois.

Manahawken & Long Beach.—Arrangements are being made to build a railroad from Manahawken, N. J., to Long Beach, crossing Barnegat Bay at the Cedar Bonnet. The company will also build a summer hotel on Long Beach, where a large tract of land has been bought.

Memphis & Little Rock.—The *Commercial and Financial Chronicle* says: "The control of this company was obtained by the St. Louis, Iron Mountain & Southern over a year ago. On Jan. 1, 1882, the coupons of the first-mortgage bonds were allowed to go to default. Mr. Marquand (President of the company) then advertised that he would *purchase* the coupons, holding them still as a lien under the mortgage."

Missouri Pacific in Nebraska.—Track is now laid to Sheridan, Neb., 35 miles north by west from the late terminus at Falls City, and 50 miles from Hiawatha, Kan., the junction with the St. Joseph & Western. Trains run through to the new terminus from St. Joseph and Atchison.

Nashville, Chattanooga & St. Louis.—This company makes the following statement for January and the seven months of its fiscal year from July 1 to Jan. 31:

	January.	Seven months.
Gross earnings	$156,993	$1,153,027
Expenses	102,399	704,654
Net earnings	$54,594	$448,373
Interest and taxes		314,955
Surp'us		$133,418

For January there was a decrease of $21,150, or 11.9 per cent., in gross earnings, and an increase of $14,379, or 35.8 per cent., in net earnings. The seven months show a decrease of $49,859, or 41.4 per cent., in gross earnings, and an increase of $3,917, or 0.9 per cent., in net earnings.

New York, Chicago & St. Louis.—A mortgage to the Central Trust Company, of New York, to secure an issue of $15,000,000 in 6 per cent. 40-year bonds, has been executed and filed for record. This is the first incumbrance on the road.

A number of officers of the road and others recently made an excursion over the line from Cleveland to Ashtabula and return. As before noted, the road is built generally on a high level, with no deep cuts and with more filling than cutting. At Painesville there is a bridge and an iron trestle 83½ ft. high, and at Ashtabula a bridge 106 ft. above the water and 630 ft. of iron trestle approaches 92 ft. high. This trestle maintains its height throughout, and is across the Ashtabula River, which was made famous by the fall of the Lake Shore bridge, which crosses a few rods to the northward, in 1877. At Conneaut is a similar structure about 60 ft. high and 1,310 ft. long. At Willoughby, over the Chagrin Falls Valley, there is an 800-ft. wooden trestle averaging about 45 ft. high, which is being filled with earth its entire length.

The parties chiefly interested in the road are Messrs. George I. Seney, John T. Martin, A. A. Low & Brothers, E. H. R. Lyman, A. M. White, W. H. Brown and R. T. Wilson, of New York; C. R. Cummings and W. B. Howard, of Chicago; John S. Newberry and James McMillan, of Detroit; Dan P. Eells, W. H. Harris, John Rockefeller, H. F. Flagler, H. B. Payne and H. L. Terrell, of Cleveland; Samuel Thomas and Governor Foster, Columbus; Calvin S. Brice, of Lima, O.; Col. E. W. Cole, of Nashville, and C. M. McGhee, of Knoxville, Tenn.; W. T. Walters, of Baltimore, and others. A number of these gentlemen are also largely interested in the Lake Erie & Western, the Ohio Central and the East Tennessee, Virginia & Georgia roads.

The company will soon begin work on a branch from Valparaiso, Ind., to Joliet, Ill., intended to secure connections for through business west of Chicago without passing through that city.

New York, Lackawanna & Western.—This company has accepted the route into Buffalo as granted by the City Council, and has fixed upon a location for its city passenger station. Work on the road into the city will be pushed.

New York, Lake Erie & Western.—Payments of employés on this road will hereafter be made by check or draft, instead of in currency. Arrangements have been made with banks on the line to cash the drafts. This will avoid the risks incident to sending large amounts of currency over the line in the pay car.

A second track is to be laid over the Western Division from Hornellsville to Salamanca, to be extended from Salamanca to Dunkirk hereafter. This improvement will be paid for from the proceeds of bonds reserved for improvements.

New York, Ontario & Western.—On Feb. 21 a number of charges in one of the headings of the tunnel under Bergen Hill, back of Weehawken, exploded prematurely, doing some damage. The men were making the connections with the wires, and it is supposed that the wire leading into the heading was struck by lightning.

New York, Pennsylvania & Ohio.—This company has closed a contract with Messrs. Clark, Post & Martin, of New York, for the lease of 2,700 cars for freight traffic. The cars are of the latest improved patterns, being made at the Terre Haute Car Works, St. Louis Car & Foundry Company, Ohio Falls Car Works, and Tiffin Car Works. The standard value of the box cars in contract is estimated at $800 each. The stock and other cars are estimated proportionately. According to the agreement, the New York, Pennsylvania & Ohio Company will pay to Clark, Post & Martin, $1,822,422.84 in 84 consecutive monthly payments of $21,695.31. This is one of the largest rental contracts ever made by any corporation.

Oakdale Iron Works.—The Oakdale Iron Co., which owns this road, has nearly completed an extension about eight miles long from Oakdale, Tenn., to the coal mines at Winter's Gap. It is proposed to extend the road from Oakdale Junction to Knoxville, about 40 miles.

Pennsylvania.—In answer to a question from a Congressional committee, President Roberts writes that this company neither expects nor desires compensation for special trains or services rendered to the late President. The company's officers were glad of an opportunity to do anything in their power to alleviate the President's sufferings, and no compensation will be asked for or accepted.

The Philadelphia *Press* of Feb. 22 says: "Great satisfaction has been caused by the informal announcement made yesterday that the Pennsylvania Railroad Company is arranging a pass system by which all employés are to be able to travel without charge between their working place and the station nearest their residence. The announcement is received all the more gratefully since it has been entirely unexpected and follows so closely on the heels of the attempt to kill off illegitimate passes, 75 per cent. of whose holders of all classes were cut off on Jan. 1. The last cut off includes almost every employé of every class, among them men who had never paid a fare in 20 years, but who had always ridden either on passes, under their general character as known employés, or during the last seven or eight years under their uniforms.

"The company has always been willing to carry its workmen, as is shown by the modoc trains which run morning and evening from both Jersey City and Newark to the Meadows shops, where from 700 to 1,100 skilled mechanics are employed. None but employés are ever carried on these trains, and no tickets are ever used. The trouble has, however, been to make the system universal without subjecting it to abuse. This, after careful investigation, it is now intended to do by means of a general pass in the form of a commutation ticket. Every one who does not live within easy reach of the modoc stations will be included. Heretofore passes have been a matter of personal or political favoritism, which has given rise to many complaints. Now every man is to have a pass, but under restrictions which, it is believed, will make it impossible for him to use it except in going to or from his work. There has naturally been much jealousy between the men who had to pay their fare and those who did not.

"The new tickets will be printed with a numbered border containing 54 numbers, or two for each round trip for the 27 working days of the month. The conductor will punch out a number for each trip each way, and tickets will not be good unless used within the month of their issue. Thus far they are similar to the passengers' commutation ticket. But they will not be accepted upon any train on Sundays, and if they are found in other hands than those in whose name they are issued they will not only be taken up and forfeited, but the man to whom the ticket is issued will lose his position under the company.

"Several hundreds of these passes will be issued with the first of the month, and the half-cent a mile employés' commutation ticket will be abolished."

Philadelphia & Reading.—The Receivers' statement for the month of January is as follows:

	1882.		1881.
Railroad Co.:	Gross.	Net.	Net.
Railroad traffic	$1,427,847.68	$561,065.92	$491,171.31
Canal traffic	*473.23	*19,394.18	*11,044.56
Steam colliers	70,461.74	43,656.71	17,775.21
Richmond barges	5,239.27	*1,925.56	1,738.47
Total R. R. Co	$1,503,075.46	$584,002.89	$499,640.43
Coal & Iron Co	948,390.84	62,910.74	55,129.29
Total	$2,451,466.30	$646,913.63	$554,769.72

* Loss.

The month shows a considerable gain. A comparison of the net earnings for the two months of the fiscal year from Dec. 1 to Jan. 31 is as follows:

	1881-82.	1880-81.	Increase.	P. c.
Railroad Co	$1,454,614.20	$1,019,333.15	$435,281.05	47.7
Coal & Iron Co	129,841.97	75,893.22	53,948.75	71.0
Total	$1,584,456.17	$1,095,226.37	$489,229.80	44.7

The railroad shows a very large increase both for the month and the year.

The traffic reported is as follows:

	January.		Two months.	
	1882.	1881.	1882.	1881.
Passengers	898,600	754,799	1,825,208	1,506,115
Tons freight	593,091	442,629	1,180,013	878,840
Tons coal	508,147	494,097	1,268,492	1,012,328
Tons coal on colliers	48,285	36,285	95,320	78,275
Tons coal mined:				
By Coal & Iron Co	240,432	222,234	624,372	431,457
By tenants	89,706	96,942	219,209	209,014
Total	330,138	319,176	843,581	640,471

The increase in coal was considerable; that in passengers and general freight was remarkable.

Philadelphia, Wilmington & Baltimore.—The connection between the main line and the Newark & Delaware City Branch at Newark, Del., has been completed. The branch will now be used as a short cut for Baltimore and Southern business to and from the Delaware Division, making a considerable saving in distance over the route by Wilmington.

Pittsburgh, Cincinnati & St. Louis.—It is again reported that this company will build a cut-off line from Richmond, Ind., on the Columbus, Chicago & Indiana Central road, to the Little Miami at Camp Dennison near Cincinnati. The object is to shorten the line between Chicago and Cincinnati.

Point Pleasant & Iron Mountain.—It is proposed to build a railroad from Point Pleasant, Mo., on the Mississippi River to Clarkton and thence to a point on the St. Louis, Iron Mountain & Southern road. The plan also includes a line from the river opposite Point Pleasant to the Nashville, Chattanooga & St. Louis at Union City, Tenn., running through Obion and Lake counties.

Quebec, Montreal, Ottawa & Occidental.—It is reported that the government of the province of Quebec has agreed to sell the Western Division of this road, from Montreal to Ottawa, to the Canadian Pacific Company. The price named is $4,000,000.

Shenandoah Iron Works.—A railroad has lately been completed from the Shenandoah Iron Works, on the Shenandoah Valley road in Page County, Va., to the Fox Mountain ore bank. It is six miles long and will be used entirely for carrying ore and stone.

Shenango & Allegheny.—This company has offered to build a spur from its road at Mercer station to the village of Mercer, Pa., a distance of 1½ miles, provided the people interested will pay for the right of way and grading. The offer will probably be accepted.

Southern Fast Mail Trains.—The fast mail train which has been running over the Coast Line to Savannah, has been extended over the Savannah, Florida & Western road to Jacksonville. This will reduce the time between New York and Jacksonville about one-third, with a corresponding reduction of time to points on the St. Johns River.

South Carolina.—It is reported that negotiations are in progress for the sale or lease of this road to the Richmond & Danville Company. The latter company is said to have made a very favorable offer, which is now under consideration. The possession of this road will give the Richmond & Danville a line into Charleston, and cut off competition at Augusta to a great extent.

Troy & Greenfield.—The last rail has been laid on the second track through the Hoosac Tunnel, and only a small amount of ballasting remains to be done before the track can be brought into use.

Tuscaloosa, Jasper & Florence.—This company has been organized to build a railroad from Tuscaloosa, Ala., to Florence.

Union, of Baltimore.—A contract has been made for the sale of the capital stock of this company to the Northern Central Company at par. The Union Company owns the road and tunnel through Baltimore which forms the connection between the Northern Central, the Baltimore & Potomac, the Philadelphia, Wilmington & Baltimore and the Canton wharves. The capital stock is $600,000, and is owned by the Canton Company. There is a bonded debt of $1,500,000 upon it.

Union Pacific.—This company makes the following statement for the month of December last:

	Earnings.	Expenses.	Net. or Deficit.	
Union Division	$1,452,990	$567,568	Net.	$885,422
Union branches	457,190	311,463	Net.	145,727
Kansas Division	406,456	395,642	Net.	10,814
Kansas branches	81,769	88,176	Def.	6,407
Denver & S. Park Div.	111,201	134,401	Def.	23,200
Total	$2,509,606	$1,497,250	Net.	$1,012,356

Work is progressing on the extension of the Denver & South Park Division from Georgetown, Col., to Leadville.

Virginia Railroad Projects.—Bills have been introduced in the Virginia Legislature to charter new companies as follows:

Fauquier & Rappahannock, to run from a point on the Virginia Midland, in Fauquier County, to Sperryville, in Rappahannock County.

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the present volume of the *Railroad Gazette:*

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Illinois Central.

This company now operates 1,320.35 miles of road, whereof 918.19 miles are in Illinois and 402.16 in Iowa. The Illinois lines consist of the Chicago Division, Chicago to Cairo 364.73 miles; the North Division, Centralia to Dubuque, 340.77 miles; the Springfield Division, Gilman to Springfield, 111.47 miles; the Middle Division, Otto to Colfax and Kempton to Minonk, 101.22 miles. The Springfield and Middle divisions, though really owned, are nominally under separate organizations. The Iowa lines consist of a main line from Dubuque to Sioux City, 326.58 miles, and a branch from Cedar Falls to Mona, 75.58 miles; they are leased from three companies, the Dubuque & Sioux City, the Iowa Falls & Sioux City and the Cedar Falls & Minnesota. There are 29.68 miles of second, third and fourth tracks and 204.05 miles of sidings, making in all 1,554.08 miles of track, of which 763.52 miles are laid with steel. The report is for the year ending Dec. 31.

The equipment consists of 224 engines; 103 passenger, 9 old passenger, 12 smoking, 17 sleeping, 12 baggage and smoking, 10 postal and 37 baggage, mail and express cars; 3,296 box, 50 Blue Line box, 111 combination, 51 fruit, 95 refrigerator, 4 powder, 583 stock, 278 flat, 1,373 coal and 110 caboose cars; 2 officers' cars, 1 pay-car and 18 service cars.

The general balance sheet is as follows:

Shares		$29,000,000.00
Funded debt:		
Six per cent. sterling bonds, 1895	$2,500,000	
Five per cent. sterling bonds, 1905	1,000,000	
Sterling sinking fund 5s of 1903	4,150,000	
Springfield Division 6s	1,600,000	
Middle Division 5s	500,000	
		9,750,000.00
Past due and called:		
Currency redemption 6s	$159,500	
Sterling sinking fund 5s	6,060	
Construction bonds of 1875	4,000	
		169,500.00
Investment fund (balance of income)		5,212,169.93
Insurance fund		61,963.40
Total		$44,193,633.33
Permanent expenditures, Illinois	$33,000,000.00	
" " Iowa	1,080,728.37	
Springfield Div	1,600,000.00	
Middle Div	500,000.00	
Total property		$36,180,728.37
Chi., St. L. & N. O. bonds at par	3,632,000.00	
" " " stock, 66,700 shares at 40		2,668,000.00
Assets, New York		921,255.49
" Chicago		195,008.17
Working stock of supplies		534,677.90
Assets in insurance fund	61,963.40	
		44,193,633.33

Changes during the year were the retirement of $50,000 sterling sinking fund 5s., and $2,500,000 currency redemption 6s., and the addition of $300,000 Middle Division bonds. There was a reduction of $3,129,000 in the amount of Chicago, St. Louis & New Orleans bonds owned.

The yearly interest charge on the funded debt is $528,500. There is no floating debt.

The traffic for the year was as follows:

Train miles:	1881.	1880.	Inc. or Dec.	P. c.
Passenger	1,838,264	1,717,504	I. 120,760	7.0
Freight	3,746,797	3,459,069	I. 287,728	8.2
Construction	111,372	191,301	D. 79,929	42.0
Switching	1,310,099	1,145,737	I. 164,362	14.7
Total	7,006,532	6,513,611	I. 492,921	7.6
Passengers carried	4,008,047	2,753,544	I. 1,254,503	45 6
Passenger miles	82,068,222	63,306,528	I. 18,761,694	29.1
Tons freight carried	2,875,833	2,703,582	I. 172,251	6.3
Ton miles:				
North-bound	181,190,433	182,920,966	D. 1,730,533	0.9
South-bound	204,844,991	198,367,516	I. 6,477,475	3.3
Total	386,035,424	381,288,482	I. 4,746,942	12.4

Locomotive service cost 16.58 cents per mile run, against 14.95 cents in 1880, and 14.15 cents in 1879.

The suburban trains between Chicago and Kensington last year carried 2,537,141 passengers who traveled 23,709,406 miles, showing a very large increase over the previous year.

The average receipts per train mile and per unit of traffic were, in cents:

Per train mile:	1881.	1880.	Inc. or Dec.	P. c.
Earnings	122.55	127.76	D. 5.21	4.1
Expenses	59.35	56.39	I 2.96	6.7
Net earnings	63.20	71.37	D. 8.17	11.5
Per pass. per mile	2.16	2.51	D. 0.35	14.0
Per ton per mile:				
North-bound	1.53	1.59	D. 0.06	3.7
South-bound	1.51	1.50	I. 0.01	0.6
Through	1.02	1.03	D. 0.01	0.9
Local	1.65	1.69	D. 0.04	2.4
Average of all	1.52	1.54	D. 0.02	1.3

The earnings for the year were as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Freight	$5,875,649.38	$5,883,122.58	D. $7,473.20	0.1
Passengers	1,775,721.04	1,591,428.53	I. 184,292.51	11.6
Mail	153,117.25	148,104.63	I. 5,012.62	3.4
Express	138,498.70	141,266.51	D. 2,767.81	1.9
Miscellaneous	643,411.07	558,203.76	I. 85,207.31	15.3
Total	$8,586,397.44	$8,322,126.01	I. $264,271.43	3.2
Expenses	4,158,167.22	3,672,971.18	I. 485,196.04	13.2
Net earnings	$4,428,230.22	$4,649,154.83	D. $220,924.61	4.7
G. earn. per. m.	6,503.12	6,302.97	I. 200.15	3.2
Net " "	3,353.83	3,521.15	D. 167.32	4.7
P. c. of exps.	48.42	44.13	I. 4.29	

The causes for the increase in operating expenses were a protracted and severe winter, accompanied by heavy and long continued snows, the consequent increased consumption of fuel and other supplies, the higher prices paid for supplies and the higher rates of wages generally prevailing.

Miscellaneous earnings included $36,095.24 from sleeping cars; $71,142.66 from rents of property; $240,228.34, rent of tracks; $16,757.42, storage and dockage; $37,997.87, switching; $4,450, train news agency; $3,397.62, Cairo wharf-boat; $139,969.93, inter-state (Cairo) transfer; $93,371.99, mileage of cars and engines.

The earnings were divided as follows:

Gross earnings over line owned		$5,502,757.31
Net earnings over C., B & Q		431,062.27
Earnings over other lines		119,383.51
Cairo wharf-boat and transfer		143,367.55
Springfield Division		313,109.04
Middle Division		224,274.49
Total earnings in Illinois		$6,733,954.17
Leased lines in Iowa:		
Dubuque & Sioux City	$1,110,041.50	
Iowa Falls & Sioux City	622,185.48	
Cedar Falls & Minnesota	120,216.29	
		1,852,443.27
Total		$8,586,397.44
Working expenses		4,158,167.22
Net earnings		$4,428,230.22
Charter tax paid state of Illinois	$384,582.52	
Taxes on leased lines in Illinois	21,571.50	
Taxes on leased lines in Iowa	59,197.87	
Rental of leased lines in Iowa	735,696.59	
		1,201,048.48
Net results of operation		$3,227,181.74

The Land Department reports that during 1881 there were sold 24,244.68 acres of donated lands to 429 persons, for $135,587.57; averaging to each purchaser 56.51 acres; average price per acre, $5.59. Donated town lots were sold to the amount of $1,143.60. Purchased lands belonging to this Department, 40 acres, for $249.00; purchased lands belonging to the Operative Department, 31 acres, for $964.87; and purchased town lots, for $694.50. The number of sales canceled was 148, for 5,944.71 acres. Deeds issued, 350, for 16,640.42 acres. The whole area of donated lands conveyed to date, 2,276,322.99 acres, leaving uncoveyed, 318,031.89 acres. Total sales of donated lands, 2,367,422.29 acres, leaving unsold, 226,852.59 acres, located chiefly in Southern Illinois, over two-thirds being south of the Ohio & Mississippi road. The gross receipts from sales were $144,548.40; charges, $20,616.14, leaving a balance of $123,932.26, which was paid over to the Treasurer. There are on hand bills receivable and contracts for land sold amounting to $368,978.52.

The application of income was as follows:

Balance, Dec. 31, 1880		$5,395,089.50
Less premium on $2,340,500 redemption bonds retired		234,050.00
Balance		$5,161,039.50
Net receipts from road, as above		3,227,181.74
Land Department		123,932.26
Interest on Chi., St. L. & N. O. bonds		161,105.00
Premium on Chi., St. L. & N. O. bonds sold		150,000.00
Total		$8,823,278.50
Interest on bonds, less exchange	$655,708.21	
Construction account	925,380.36	
Dividends, 7 per cent	2,030,000.00	
		3,611,088.57
Balance, Dec. 31, 1881		$5,212,169.93

The total receipts of the year were $51,130.43 in excess of all charges and payments, including construction account.

During the year 11 engines, 12 passenger and 183 freight cars were added to the equipment. Five engines and a number of cars were built to replace old ones worn out. A large number of cars were rebuilt.

The amount charged to new construction was $794,783.76 in Illinois and $39,874.76 in Iowa. The work executed included the Randolph street viaduct and new docks in Chicago; the substitution of several iron bridges for wood, filling in trestles, new station buildings, 10.43 miles new sidings, the increased cost of steel over iron rails and new ballast for 29.48 miles of track.

Maintenance of way included the usual renewals; 10,098.47 tons of steel rails and 345,260 new ties were put in the track. There were 49.77 miles of new fence built.

General Superintendent Jeffery's report says: "The rapid growth of suburban travel between Chicago and Kensington necessitated an addition of 12 cars to the passenger equipment. Six locomotives and 50 cars are employed daily to meet the requirements of this traffic.

"The completion of two new docks, each 300 ft. wide and 1,000 ft. long, and of the Randolph street viaduct, added greatly to our terminal facilities in Chicago; the viaduct is 1,725 ft. long, and consists of 183 ft. of substantial masonry and 1,542 ft. of wrought-iron bridge, supported by iron columns resting upon stone and pile foundations.

"During the year 2,350 additional feet of stone wall was built on the west line of the right of way in Chicago, and 12 stalls are added to the east engine house at Weldon.

"New stone piers were built under the large iron bridge across Kankakee River.

"The Middle Division (Kankakee & Southwestern Railroad) was fully equipped with 10 locomotives, 400 freight and 4 passenger and baggage cars; 15 miles of track were ballasted, and 8 grain elevators, of from 25,000 to 30,000 bushels capacity, were erected.

"The elevator at Cairo was completed and put in operation; it is provided with the best machinery and appliances for receiving and storing grain and delivering it to barges and cars as occasion may require. A large yard, with suitable tracks for handling cars, was made in connection with the elevator.

"The change of gauge of the Chicago, St. Louis & New Orleans Railroad to the Illinois Central standard has greatly relieved Cairo, lessened very materially the expenses of the station, and doubled its capacity for interchanging business with the Southern Line."

We have already published the directors' report, on page 96 of the present volume.

Northern Central.

This company owns a line from Baltimore north to Sunbury, Pa., 138 miles; an extension of 4 miles to the Canton freight wharves in Baltimore, and the Green Spring Branch, from Relay House to Green Spring, Md., 9 miles. It leases the Shamokin Valley & Pottsville road, Sunbury, Pa., to Mt. Carmel, 28 miles; the Williamsport & Elmira, 78 miles; the Chemung road, 22 miles; and the Elmira, Jefferson & Canandaigua, 47 miles, the three last-named forming a line from Williamsport, Pa., to Canandaigua, N. Y., 147 miles. Its trains use the Philadelphia & Erie track from Sunbury to Williamsport, 40 miles, and the Philadelphia & Erie trains use its track from Marysville to Sunbury, 47 miles. The total mileage is 151 owned, 175 leased, 326 miles in all, besides 40 miles used.

The following statements are from the President's report for the year ending Dec. 31, 1881:

The general account is as follows.

Stock		$5,842,000.00
Mortgage to state of Maryland, irredeemable, 6 per cent		1,500,000.00
Funded debt		13,878,000.00
Current accounts and balances		1,324,782.53
Depreciation fund for coal lands		74,692.97
Profit and loss		305,696.75
Total		$22,925,172.25
Road and equipment	$17,520,820.23	
Stock of leased lines	3,048,080.82	
Bonds and stocks	654,396.64	
Materials and supplies	496,108.86	
Trustees of sinking fund	348,907.26	
Accounts and balances receivable	442,026.60	
Cash	413,631.84	
		22,925,172.25

The bonded debt consists of $1,490,000 sinking fund 6 per cent. bonds; $1,126,000 coupon 6 per cent. bonds; $2,804,000 6 per cent. gold bonds; $4,526,000 consolidated general mortgage 6 per cent. bonds; $2,932,000 second general mortgage 5 per cent. bonds and $1,000,000 second general mortgage 6 per cent. bonds. The yearly interest charge, including the Maryland loan, is $893,360.

The earnings for the year were as follows:

	1881.	1880.	Inc. or Dec.	P.c.
Freight	$4,396,187.09	$4,131,008.16	I. $265,178.93	6.4
Passengers	808,553.81	695,430.28	I. 113,123.53	16.3
Mail and exp.	122,960.43	106,306.76	I. 16,653.67	15.3
Miscellaneous	115,998 67	117,642.09	D. 1,643.42	1.4
Total	$5,443,700.00	$5,050,387.29	I. $393,312.71	7.8
Expenses	3,787,445.91	3,255,268.45	I. 532,177.46	16.4
Net earn.	$1,656,254.09	$1,795,118.84	D. $138,864.75	7.7
Gross earn. per mile	16,698.47	15,491.99	I. 1,206.48	7.8
Net earn. per mile	5,080.52	5,506.50	D. 425.98	7.7
Per cent. of expenses	69.57	64.42	I. 5.15	

The gross earnings per mile of the various divisions were: Baltimore Division, $26,310; Susquehanna Division, $24,827; total main line, $25,805; Green Spring Branch, $814; Shamokin Divison, $17,755; Elmira Division, $10,656; Chemung Division, $8,761; Canandaigua Division, $7,536.

The income account, somewhat condensed, was as follows:

Net earnings as above		$1,656,254.09
Interest, dividends, royalties on coal, etc		261,199.91
Total		$1,917,454.00
Interest paid	$935,881.80	
State tax on capital stock	10,140.39	
Half gain on Elmira, Chem. & Can. divisions, paid Penna. R. R. Co	32,184.92	
Rental, etc., Shamokin Div	202,646.78	
" Elm. & Wmsport	170,985.48	
" Chemung R. R	31,328.47	
" Elm., Jeff. & Can	39,065.65	
One-half deficit on interest, Balt. & Potomac	37,177.78	
		1,459,417.27
Surplus for the year		$458,036.73
Dividends, 6 per cent		350,517.00
Balance to profit and loss		$107,519.73
Balance, Dec. 31, 1880		187,708.45
Premium on bonds, etc		10,468.57
Balance, Dec. 31, 1881		$305,696.75

The traffic for the year was as follows:

	1881.	1880.	Inc. or Dec.	P.c.
Pass. carried	2,430,102	1,913,734	I. 516,428	27.0
Passenger miles	34,370,948	29,880,642	I. 4,490,306	15.0
Tons freight moved	10,527,706	9,460,229	I. 1,067,477	11.3
Ton miles	506,180,310	461,904,456	I. 44,275,854	9.6
Average rate:				
Per pass. per mile	2.352 cts.	2.327 cts.	I. 0.025 ct.	1.1
Per ton per mile	0.869 "	0.894 "	D. 0.025 "	2.8

The receipt per passenger mile was 2.352 cents; cost, 2.167 cents, leaving a net profit of 0.185 cent.

The earnings, expenses and profit per ton per mile on the various divisions of the road were, in cents:

	Earnings.	Expenses.	Profit.
Baltimore Div	0 971	0.848	0.123
Susquehanna Div	0.797	0.393	0.404
Whole main line	0.903	0.673	0 233
Green Spring Branch	3.171	1.755	1.416
Shamokin Div	1.335	0.478	0.857
Elmira Div	0.725	0.507	0.218
Chemung Div	0.540	0.381	0.159
Canandaigua Div	0.725	0.528	0.197
Average, whole road	0.869	0.661	0.208

The report says: "The coal tonnage of the main line in 1880 was 1,375,792 tons, and in 1881, 1,555,045 tons. There was a decrease in trade going to the Pennsylvania Railroad at Marysville of 16,606 tons. There was a decrease of 2,746 tons to points on the Cumberland Valley Railroad. The total tonnage to Baltimore was 458,725 tons, an increase of 125,058 tons in 1881.

"The coal tonnage of the Shamokin Branch in 1881 was 1,147,781 tons, and in 1880 it was 978,022 tons, showing an increase of 169,759 tons.

"The coal tonnage of the Elmira & Williamsport Railroad in 1881 was 1,012,617 tons, and in 1880, 800,422 tons, an increase of 212,195 tons. The increase from the McIntyre mines, near Ralston, was 17,098 tons. In the north-bound anthracite trade there was a decrease of 56,320 tons.

"The coal tonnage of the Chemung Railroad was increased from 553,251 tons in 1880 to 717,214 tons in 1881—an increase of 163,963 tons.

"On the Canandaigua Railroad the coal tonnage of 1880 was 483,263 tons; in 1881, 639,732 tons, an increase of 156,469 tons. There was an increase of 4,751 tons in shipments to Coal Point, at Watkins, N. Y., and an increase of 151,718 tons in shipments to other stations.

"The decrease in the bituminous coal tonnage from the Erie Railway and Tioga & Elmira State Line Railroad destined to points north of Elmira, as compared with the previous year, was 3,666 net tons, the decrease in revenue from this source being $987.96; but there was an increase of 105,335 tons in the aggregate movement of bituminous coal.

"The tonnage of both classes amounted to 2,900,707 tons, as against 2,562,350 for the preceding year, being an increase of 338,357 tons in the actual aggregate of coal transported, irrespective of the number of divisions over which it was moved. The main items of tonnage, beside coal and grain, were lumber, iron ore, manufactures of iron and petroleum.

"The amount of grain carried over your lines, though of large volume, shows a decrease as compared with the preceding year, due mainly to the falling off in the foreign demand. There were carried over your lines to Baltimore in 1881, 17,911,677 bushels of grain; in 1880, 19,851,032 bushels, a decrease of 1,939,355 bushels, or 9.8 per cent.

"On account of the demand for increased facilities for handling the large amount of grain carried over your lines, your board have under consideration the propriety of erecting an additional elevator at Canton, with a

capacity of 800,000 bushels. In order to provide the necessary yard and siding room at that point for your traffic, a further purchase was made from the Canton Company of about 9½ acres, in the vicinity of property now held by you under lease, for which the sum of $183,549.86 was paid. This expenditure forms the main item in the increase of your capital account for the year. The entire expenditures on real estate account were $199,594.86, and credit being given for the proceeds of sales of property in Baltimore, not needed for the operation of your line, the net increase of that account was $168,862.46.

"In order to meet the requirements of your traffic, 600 box cars and 650 hopper gondola cars are being placed upon your lines through the agency of a car trust, under which a rental is paid each year sufficient to take care of the interest upon their cost, and also pay off a portion of the paincipal.

"The passenger business for the year shows a marked improvement, the passenger mileage increasing 15 per cent., and the revenue received therefrom, $113,123.53, or 16 27 per cent.

"The increase of 9.59 per cent. in tonnage mileage, with an increase of only 3 per cent. in mileage of engines, shows the greater efficiency of your motive power. The condition of the passenger equipment was fully maintained, while that of the freight equipment was, as hereinafter noted, greatly improved. The road-bed and track were also improved, and the main tracks between Baltimore and Canandaigua are now entirely laid with steel.

"An arrangement was perfected during the year for the exchange of the $1,000,000 of 6 per cent. second general mortgage bonds, for 5 per cent. bonds secured by the same mortgage. These 6 per cent. bonds, it will be remembered, carried with them the option of conversion at any time before maturity into the capital stock of your company at par. In the exchange, this option is surrendered, and your company secures, by the payment of $150,000 cash, an annual reduction of 1 per cent. upon these bonds for the 44 years yet to elapse before their maturity.

"It may not be known to all the shareholders of your company that, in order to enable your traffic to reach tidewater, and be interchanged with the Philadelphia, Wilmington & Baltimore Railroad at Baltimore, it was necessary to use the Union Railroad, which was built to give your road connection with the property of the Canton Company at tide-water, and to form a connecting link between the Philadelphia, Wilmington & Baltimore Railroad and the Baltimore & Potomac Railroad. The contract existing between your company and the Union Railroad Company for the use of its road, made in 1873, was then considered reasonable and proper, and was probably the best that could have been made; but the great increase of this tonnage, and the low rates prevailing thereon, have made what was at that time a fair rate of toll now a burdensome one. Your board, therefore, deemed it necessary for the interests of your company and the proper development of its traffic that you should have your own line extending to tide-water. For this purpose they had very careful surveys and estimates made, the result of which showed that it would be more advisable to acquire the ownership of the present line, if it could be had at a fair price, than to incur the expense and difficulties attending the construction of a new road. Negotiations were accordingly opened on the part of your company with the Canton Company, which resulted in an agreement by which your company purchased the entire share capital of the Union Railroad Company, amounting to 6,000 shares, at its par value of $100 per share, subject to a mortgage indebtedness of $1,500,000 of 6 per cent. bonds.

The gross earnings of the Union Railroad Company for the past year were	$287.295.00
Expenses	61,324.00
Net earnings	$225,971.00

"Of the gross earnings your company paid $254.365.20

"As the charges upon the traffic referred to were fixed by the contract, and as the traffic was steadily increasing, it will readily be seen that the purchase of this line must result in a large and direct pecuniary saving to your company, besides giving it what is essential to its interests—an absolute ownership of a line extending to tide-water, and a connection with the Philadelphia, Wilmington & Baltimore Railroad, now owned and operated in harmony with your system.

"For the purpose of obtaining the means to pay for the capital stock of the Union Railroad Company, your board recommend that your share capital be increased from its present amount of $5,842,000 to $6,500,000, and that the shareholders have the right to subscribe for 10 per cent. of their present holdings at par.

"It will be noted from the income account that the gross earnings of the line were increased nearly 8 per cent., but that the expenses were increased about 16 per cent., making a reduction in net earnings of $138,864.75. This was due partly to the reduction in rates and to the increased cost of labor and material. It is proper to state, however, in this connection, that there were also included in the expenses the following items of extraordinary outlay, a large portion of which might have been charged to construction and equipment; but it was thought wise to fill vacant numbers in your freight car equipment, and to defray the other expenditures out of earnings, rather than increase your capital account:

Amount expended for new freight cars and charged to operating expenses	$345.000.00
Cost of new tracks, extending piers, etc., at Canton	43,036.78
Extensions of second and third tracks and sidings on the line of the road	59.509.71
Addition to tobacco warehouse at Canton	10,005.00
Making an aggregate of	$457,551.49

"The income account shows that, after deducting these extraordinary expenditures, which amounted to over 7 per cent. upon your capital stock, your company earned during the past year about 8 per cent., out of which two dividends of 3 per cent. each were paid in cash to your shareholders.

"It will also be noted from the income account that instead of your company having to make any contribution toward meeting the operating expenses and rentals upon the Elmira, Chemung and Canandaigua divisions, a profit was realized therefrom of $32,184.92; but that there was charged against your income for the year one-half of the deficit of the Baltimore & Potomac Railroad Company in meeting the interest upon its bonds, amounting to $37,177.78. It is confidently hoped from the great improvement being made in that property that this deficit will in the future be materially reduced.

"As appears by the statement attached to the report, there are now in the insurance fund securities amounting, at their par value, to $100,000, being a considerable increase over last year."

Lehigh Coal & Navigation Company.

This Company owns a great coal property in the Lehigh and Wyoming anthracite regions; it owns the Lehigh Canal from Mauch Chunk, Pa., to Easton, and leases the Delaware Division Canal from Easton to Bristol. It also owns the Lehigh & Susquehanna road from Easton to Wilkesbarre, 105 miles, with 50 miles of short branches, and leases the Lehigh & Lackawanna, 25 miles; Nesquehoning Valley road, 17.5 miles, and the Tresckow road, 6.5 miles. These railroads, 204 miles in all, are leased to the Central Railroad Company, of New Jersey. The report is for the year ending Dec. 31, 1881.

The report says: "The first-mortgage 6 per cent. loan of $5,381,840.84 matures in April, 1884, and may be paid off in whole or in part by the sale of securities controlled by the company, and the balance, if any, probably extended at a lower rate of interest.

"In resuming the payment of dividends, the board deemed it wise to retain a strong reserve of net earnings, under the conviction that this policy, together with a gradually increasing stock basis, and steady reduction of the debt of the company, would establish the stock upon a secure foundation of productive value.

"In order to clear our books of all accounts not likely to prove of any future value, we have charged to our old profit and loss account several items of loss which had accumulated previous to 1880, and were not therefore properly chargeable to the surplus earnings of the last two years. The balance to the credit of this account is $2,287,988.92.

"The floating debt, less cash assets, is about $700,000, against which the company holds $746,000 of its consolidated 7 per cent. bonds, $306,000 Delaware Division Canal Company bonds, and 18,901 shares of its own stock.

"The third installment of the extended debenture loan was paid at maturity, Dec. 10, leaving only $106,190.76, due Dec. 10, next, of the $762,779.18 loan that matured in 1877."

The coal tonnage of the Lehigh Canal and the railroads was as follows:

	1881.	1880.	Inc. or Dec.	P. c.
To connecting lines above Mauch Chunk	226,030	119,632	I. 106,398	88.9
Consumed on line at and above Mauch Chunk	120,799	98,654	I. 22,145	22.4
East of Mauch Chunk by canal	396,109	431,913	D. 35,804	8.3
East of Mauch Chunk by rail	3,961,754	3,255,194	I. 706,560	21.8
Total	4,704,692	3,905,393	I. 799,299	20.5

This coal in 1881 came from the following sources: Wyoming Region, 2,427,728; Upper Lehigh Region, Nescopec Branch, 531,742; Hazleton Region by Lehigh Valley road, 60,670; Black Creek Region, Drifton Branch, 365,188; Beaver Meadow Region by Nesquehoning Valley road, 556,082; Beaver Meadow Region by Lehigh Valley road, 4,778; Mahanoy Region by Lehigh Valley road, 15,389; Mauch Chunk Region, 742,642; Schuylkill Region, 473; total, 4,704,692 tons.

The revenue account for the year was as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Railroad and Nesquehoning Tunnel	$1,429,468.33	$1,157,909.22	I. $271,559.11	23.5
Lehigh Canal (inc. water power)	74,777.54	128,421.82	D. 53,644.28	41.9
Del. Div. Canal	74,044.81	90,176.38	D. 16,131.57	17.9
Net profit on Lehigh coal	240,742.76	185,626.14	I. 55,116.62	29.6
Royalty, rents, etc.	56,558.64	47,542.96	I. 9,015.68	19.0
Total	$1,875,592 08	$1,609,676.52	I. $265.915.56	16.5
General and legal exps.	59,101.24	51.792.62	I. 7,308.62	14.1
Rent and taxes, Nes. Vy. R. R.	97,050.00	97,050.00	.. ..	.....
Rent and taxes, Del. Div. Canal	120,330.04	125,438.03	D. 5,107.99	4.1
Other taxes	70,147.82	81,152.80	D. 11,004.98	13.8
Interest account	915,039.51	932,231 11	D. 17,191.60	1.8
Total exps.	$1,261,668.61	$1,287,664.56	D. $25,995.95	2.0
Net receipts.	$613,923.47	$322,011.96	I. $291,911.51	90.7

The disposition of the net earnings is reported as follows:

Net receipts, as above		$613.923.47
Sinking fund, 10 cents per ton, on 648,148 tons coal mined	$64,814.80	
Depreciation on coal improvements	65,332.85	
		130,147.65
Surplus for the year		$483,775.82
Balance to credit, Dec. 31, 1880		194,236.38
Total balance of dividend fund		$678,012.20
Dividend, $1 per share, Dec. 3, 1881		206,567.00
Balance, Dec. 31, 1881		$471,445.20

The report says: "From this balance must be deducted whatever sum shall be paid to the state under the four-mill tax law for the years 1879, 1880 and 1881. The amount for which we are held to be liable is $81,248.14, but we expect to be relieved from the payment of a considerable part of this sum."

The earnings of the 204 miles of railroad for the year were as follows:

	1881.	1880.	Increase.	P. c.
Passengers and mail	$164,286.87	$144,375.65	$19,911.22	13.8
Freight and express	540.776 58	465,397.76	75,378.82	16.2
Coal	3,517,453.87	2,804,272.00	713,181.87	25.4
Total	$4,222,517 32	$3,414,045.41	$808,471.91	23.7
Per mile of road	20,698.61	16,735.52	3,963.09	23.7
This co.'s proportion	1,407,505.77	1,138,015.13	269,489.64	23.7

The rental received by this company is 33⅓ per cent. of gross earnings. The gain last year was chiefly in coal, the roads having carried 784,077 tons more than in 1880.

The report says: "Canal navigation opened April 29, and closed Dec. 15. The late opening resulted from an ice freshet on Feb. 12, when part of Dam No. 4 was carried away, and the cost of maintaining the Lehigh Canal was thereby increased $37,865.31 over the previous year. The net revenue of both canals, after paying rent and taxes of Delaware Division Canal and tax on gross receipts, was $26,189.29, or $64,402.81 less than last year. The tonnage of the canals was 627,423 tons, showing a decrease, as compared with 1880, of 14,843 tons.

"The production of coal was 648,148 tons, an increase of 94,978 tons over 1880. We had reason at the beginning of the year to expect a much larger increase, but the cold winter and wet spring checked production, and we had a drought of unexampled severity from early summer until late in the fall. There has been a decrease from year to year in the flow of streams in the coal regions, and we have gradually added to our water supply until we have now the full flow of all accessible streams, and have constructed numerous small reservoirs.

"As our operations were seriously impeded last year, and sometimes entirely stopped, for want of water, we propose to construct a large storage reservoir in the Nesquehoning Valley, which will hold all the water needed for three months' consumption, and in addition to bore several artesian wells. Our production was further curtailed by the loss of our largest colliery, No. 9, in the underground workings of which a fire broke out on July 30, caused by the carelessness of one of our men, who disobeyed the company's orders and the advice of his associates. The fire is probably extinguished, but we cannot determine this with certainty until late in March. * * *

"It will be noticed that the income from our railroads exceeded, for the first time, the amount of our fixed charges. The former has increased largely since 1878, and the latter has steadily decreased during the same period. We may reasonably anticipate a further increase of railroad earnings and a material reduction in fixed charges during the next few years. In September, 1884, the right to convert Nesquehoning Valley Railroad stock into our own, or to pay it off, accrues to this company, which we may then exercise or continue the lease at a lower rate of dividend, as may be considerd most to our interest."

The report refers to the retirement of Mr. E. W. Clark from the presidency, and recommends the election of Mr. Joseph S. Harris in his place.

Portland & Rochester.

This road extends from Portland, Me., to Rochester, N. H., 52½ miles. During the year ending Sept. 30, 1881, for which the report is made, it was operated by a receiver for account of the creditors.

The traffic for the year was as follows:

Train miles:	1880-81.	1879-80.	Inc. or Dec.	P. c.
Passenger	89,971	90,059	D. 88	0.1
Freight	78,615	86,067	D. 7,452	8.7
Service	9,148	7,351	I. 1,797	4.9
Total	177,734	183,477	D. 5,743	3.1
Passengers carried	127,880	115,836	I. 12,044	10.4
Tons freight carried	101,872	105,817	D. 3,945	3.7

Of the passengere last year 106,370 were local and 21,510 through; of the freight 53,089 tons were local and 48,783 through. There was an increase in local and a decrease in through business.

The earnings for the year were as follows:

	1880-81.	1879-80.	Inc. or Dec.	P. c.
Passengers	$53,626.50	$50,508.80	I. $3.117.70	6.2
Freight	104,651.47	102,588.39	I. 2,063.08	2.0
Mail, etc.	10,050.61	9,536.36	I. 514.25	5.4
Total	$168,328.58	$162,633.55	I. $5,695 03	3.5
Expenses	153.293.68	137,905.36	I. 15,388.32	11.2
Net earn.	$15,034.90	$24,728.19	D. $9,693 29	38.8
Gross earn. per mile	3,206.26	3,096.45	I. 109.81	3.5
Net earn. per mile	286.38	471.01	D. 184.63	38.8
Per cent. of expenses	91.07	84.81	I. 6.26	.....

The net earnings are accounted for as follows: Receiver's notes and liabilities paid, $6,381.98; material on hand increased, $4,061.30; land for gravel pit bought, $250; increase in cash on hand, $4,341.62.

The expenses were necessarily large, the renewals having been neglected for several years. There were 229¼ tons steel rails, 40½ tons iron rails and 7,679 new ties put in the track. Extensive renewals were made of bridges and buildings, and several new buildings were erected. Several of the stations on the line were rebuilt and improved. New sidings were built at several points to accommodate business.

One new passenger car, one new combination car and 50 freight cars were added to the equipment. Land was taken to increase the yard and storage room in Portland, where additional ground was much needed.

Since the close of the year a new corporation has been organized under special acts of the Maine and New Hampshire legislatures. Its capital stock is $600,000, the 6,000 shares being issued as follows: For the $700,000 debt to the city of Portland, 3,191 shares; for the $350,000 first issue of bonds, 1,750 shares; for the $450,000 second issue of bonds, 450 shares; for each $100 of floating debt, one share, and for each 50 shares of old stock, one share. The new company has been duly organized, its stock being taken as provided. The old stock amounted to $636,012. In the reorganization no account was taken of overdue coupons, the new stock being issued for less than the face value of the old bonds.

Canadian Government Railroads.

The railroads operated by the Canadian Government for the year ending June 30 last were the Intercolonial from Point Levis (Quebec) to Halifax and St. John, 846 miles; the Windsor Branch, from the Intercolonial to Windsor, N. S., 32 miles; the Prince Edward Island, a local line in the island of that name, 199 miles, and the Canadian Pacific, 229 miles. The Canadian Pacific was worked for only 10 months of the year, being then transferred to the syndicate which is now building the road.

The earnings reported were as follows for the various lines:

	Earnings.	Expenses.	Net or deficit.
Intercolonial	$1,760,393.92	$1,759,851.27	Net. $542.65
1879-80	1,506,298.48	1,603,429.71	Def. 97,131.23
Increase	$254,095.44	$156,421.56	... .
Per cent	16.8	9.8	.....
Windsor Branch	17,462.84	20,502.26	Def. $3,039.42
Prince Edward Island	131.131.43	203,122.85	Def. 71,991.42
1879-80	113,851.11	164,646.55	Def. 50,780.44
Inc. or dec.	I. $17,280.32	I. $38,482.30	D $21,201.98
Per cent	15.2	23.2	4.0
Canadian Pacific, 10 months	291,493.02	236,944.98	Net. 54,548.04

The total expenditure on the Intercolonial, chargeable to capital, in 1881, was $608,732.80, making the total cost of construction and equipment to June last, $38,974,452. The expenditure charged to capital account for the year ended June 30, 1881, is as follows:

Halifax extension	$33,684.27
Deep-water terminus, St. John	10,373.15
Completion of the Intercolonial	24,372.54
Repairs and improvements of the Rivière du Loup section	315,362.60
Rolling stock for Rivière du Loup Branch	224,940.24

The work of relaying the Rivière du Loup section with steel rails has been completed. The gross earnings exceed those of the previous year by $254,095.

Houston & Texas Central.

This company makes the following brief statement for the year ending Dec. 31, covering 522 miles of road worked, the Texas Central extension not being included.

The earnings for the year were as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Gross earnings	$3,748,655.10	$3,741,000.47	I. $7,654.63	0.2
Expenses	2,141,872.22	2,007,323.35	I. 134,548.87	6.7
Net earnings	$1,606,782.88	$1,733,677.12	D. $126,894.24	7.3
G. earn. per m.	7,181.33	7,166.67	I. 14.66	0.2
Net " "	3,078.13	3,321.22	D. 243.09	7.3
P. c. of exps.	57.13	53.66	I. 3.47	...

Taxes are included in expenses. The interest on bonded debt was $1,157,965.56, leaving a surplus of $448,817.32.

The expenditures for betterments during the year were $1,063,113.91, to which the surplus of $448,817.32 was applied, the remainder being provided for out of the proceeds of the general mortgage bonds of the company.